# CONSUMER DECISIONS IN A COMPLEX WORLD: MEASUREMENT CONCERNS, SCALE DEVELOPMENT, AND VALIDATION IN A HEALTHCARE CONTEXT

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**CONSUMER DECISIONS IN A COMPLEX WORLD:**
**MEASUREMENT CONCERNS, SCALE DEVELOPMENT, AND VALIDATION IN A HEALTHCARE CONTEXT**

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To Mom and Dad, for their constant love and support

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Part two employs a survey design to develop and validate a scale to measure a consumer's tendency to use a complex decision style (CDS) in conceptualizing and negotiating high-stakes decision situations. Drawing from literature on cognitive style theory and complexity science, a complex approach to decision making is characterized as being complexity-focused; decision makers tend to rely more heavily on strategies such as collaborating with others and integrating a variety of information. The CDS scale is also applied within a conceptual model of choice of elective healthcare treatment, specifically, women's decisions regarding the use of hormone therapy, commonly referred to as HRT.

# CHAPTER 1

# INTRODUCTION

Part one of this dissertation provides a literature review on the development of attitude theory in marketing research and addresses concerns regarding the effects of common method variance (CMV) in published research based on the reasoned-action framework of attitudes. Although much of marketing theory is founded upon cross-sectional survey research, there are only a limited number of studies that assess the pervasiveness of method biases that are a concern in this type of research design. In this essay, a relatively new method called the marker-variable technique (Lindell and Whitney 2001) is employed in a post hoc manner to examine the influence of CMV in published studies based on the reasoned-action framework of attitudes (Fishbein and Ajzen 1975). The analyses are based on an initial sample of 663 correlations from 78 studies published in business, consumer psychology, and marketing journals from 1994 to 2005. The overall objective of this research is to infer from previously published studies the effects of CMV on relationships between variables (correlations and path estimates) within the framework of attitude theory. The results of a marker-variable analysis, logit analysis, and reanalysis of path estimates provide evidence that published studies within this context are relatively robust against the biasing effects of CMV, which helps to support the validity of same-source cross-sectional research designs.

Part one of this dissertation provides evidence that studies based on cross-sectional survey research designs are relatively robust against method biases such as common method variance. Part two utilizes a survey-based research design to develop

and validate a scale to measure a consumer's tendency to use a complex decision style in high-stakes decision situations. Drawing from literature on cognitive style theory (Goldstein and Blackman 1978) and the principles of complexity science and complex systems (Cilliers 1998; Lewin 1992; Waldrop 1992; Zimmerman, Lindberg, and Plsek 1998), individuals are hypothesized to differ in the consistent cognitive patterns they use to organize and process information in high-stakes decision situations. A complex decision style (CDS) is characterized by conceptualizing the decision situation as inherently complex and comprised of many connected parts and negotiating the decision process in a collaborative and integrative manner.

Using the scale development paradigm described by Churchill (1979) and DeVellis (2003), the CDS scale is developed and validated. Study one uses an exploratory methodology with a sample of 58 undergraduate students to generate a pool of possible items for inclusion in the CDS scale. After an assessment of the content validity of these items, study two was conducted to purify the scale. A sample of 198 undergraduate students provided preliminary estimates of reliability and scale structure. In a third study, the predictive validity of the CDS scale was assessed within the context of decisions regarding the use of hormone therapy (HRT). Both mean-level and structural relationship strength hypotheses based on CDS are also developed and tested within a model predicting women's intentions to use HRT. To the extent that we can better characterize and assess high-stakes decision styles, this information may be used in the design of decision support systems and marketing programs to increase consumer well-being.

# PART ONE

# THE INFLUENCE OF COMMON METHOD VARIANCE IN SURVEY-BASED MARKETING RESEARCH BASED ON THE REASONED ACTION FRAMEWORK OF ATTITUDES

# CHAPTER 2

## INTRODUCTION TO PART ONE

The goal of the first part of this dissertation is to quantitatively assess the prevalence of common method variance (CMV) in marketing research. Specifically, the aim is to infer from previously published studies the effects of CMV on correlations between variables within the framework of what can generally be thought of as attitude theory. The attitude construct continues to be a major focus of theory and research in the social and behavioral sciences in general (Ajzen 2001) and in the marketing literature in specific, both strategy (e.g., Chandon, Morwitz, and Reinartz 2005; Netemeyer and Bearden 1992) and consumer behavior research (e.g., Herr 1995; Sheppard, Hartwick, and Warshaw 1988). Most inquiries into the prediction of behavior from attitudinal variables are conducted within the framework of the theory of planned behavior (TPB; Ajzen 1991), and its predecessor, the theory of reasoned action (TRA; Ajzen and Fishbein 1973). Because there are numerous studies in the marketing literature that are founded upon attitudinal frameworks and because the constructs are applicable in a number of contexts (e.g., advertising evaluation, salesperson satisfaction, product choice, referral intentions), the analyses here focus on studies that are framed within the Fishbein and Ajzen (1975) paradigm.

To reexamine the results of past studies, a relatively new method is employed. This method, called the marker-variable technique (Lindell and Whitney 2001), is used mainly because it allows for the reassessment of CMV biases in past research without facing unrealistic constraints (e.g., having access to raw data, the use of multiple methods

to collect data, performing complex data analyses) that would be present if we were to use other conventional methods such as multi-trait multi-method (MTMM) and confirmatory factor (CFA) analyses. A marker variable is a variable that is included in a study, but is theoretically unrelated to at least one other variable in the same study. In the present analysis, the marker-variable technique is employed in a post hoc manner to examine whether significant relationships among attitudinal variables published in past research will hold true even after the consideration of CMV.

The outline of this part of the dissertation is as follows. The first section provides a brief literature review on consumer attitudes and the development of attitude theory in marketing research. This section also includes a comparison of the various models that have been tested in the prediction of behaviors, such as consumer choices, from attitudes. In the second section, methodological concerns with the measurement of attitudes using same-source cross-sectional survey designs are discussed. A third section briefly examines the alternative approaches for assessing CMV. The fourth section includes the results of a reassessment of marketing studies using the marker-variable technique, a sensitivity analysis, a logit analysis, and a reanalysis of path estimates. Part one of this dissertation concludes with a discussion of the research findings, theoretical contributions, limitations, and directions for future research.

# CHAPTER 3

# ATTITUDES AS PREDICTORS OF CONSUMER BEHAVIOR

An attitude is defined as representing a summary evaluation of a psychological object captured in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikeable (Eagly and Chaiken 1993; Petty, Wegener, and Fabrigar 1997). Attitudes are useful in that they assist in adaptation to a surrounding environmental context (Eagly and Chaiken 1998). In addition, attitudes serve as evaluations that direct people toward approach (as a reaction to positive evaluations) or avoidance (as a reaction to negative evaluations). Thus, when attempting to understand consumer behaviors, such as consumer choice or loyalty, it is essential to assess underlying consumer attitudes.

## 3.1 Development of Attitude Theory

Research on the prediction of individual behavior from attitudes provides strong support for the utility of the reasoned action approach. Theories that are based on the reasoned action approach include social cognitive theory (Bandura 1991), the health belief model (Rosenstock 1974), the information-motivation-behavioral skills model (Fisher and Fisher 1992), the theory of interpersonal relations and subjective culture (Triandis 1977), the theory of trying (Bagozzi and Warshaw 1990), and the prototype/willingness model (Gibbons, Gerrard, and Blanton 1998). These all share a common theme in that the construct of behavioral intentions is critical to the prediction of behavior. These theories are based on the notion that behavioral intentions and actual behaviors are caused by one's beliefs about performing the behavior. However,

behavioral intentions are also influenced by such considerations as the approval or disapproval of the behavior by important others and a sense of control over actual performance of the behavior (Ajzen 1991).

There is growing consensus that these three variables (attitudes, perceived social norms, and perceptions of control or self-efficacy) account for the majority of the variance in behavioral intentions. In fact, a number of meta-analytic studies provide evidence that intentions can be reasonably predicted by these three predictors (e.g., Albarrací

n, Johnson, and Fishbein 2001; Armitage and Conner 2001; Shepherd, Hartwick and Warshaw 1988). In the marketing literature, the TRA (Fishbein and Ajzen 1975) and the TPB (Ajzen 1991), based on these predictors, have been extensively applied to the prediction of behavior. The following section of the paper provides a brief review of the development of these theories.

### 3.1.1 Attitudes and the Expectancy-Value Model

One of the most fundamental concepts in the marketing literature is that of the attitude (Howard and Sheth 1969). In the context of the theories of reasoned action and planned behavior, attitudes are integral in the prediction of behavioral intentions (i.e., the cognitive representation of a person's readiness to perform a given behavior) and overt behavior. In this sense, attitudes toward a behavior can be thought of as the degree to which a person has an overall favorable or unfavorable evaluation of the behavior in question (Ajzen 1991).

The notion that people form attitudes towards particular behaviors led to the development of one of the first and most popular models of attitude formation and

structure which is known as the expectancy-value model (Feather 1959; Fishbein and Ajzen 1975). According to this model, attitudes develop automatically and inevitably as we encounter an object or are faced with a behavioral decision (Ajzen 2001). A person's overall attitude is determined by evaluations of the attributes associated with the object and the strength of these associations:

$$A = \Sigma b_i e_i \quad (1)$$

In this equation, the strength of each salient belief (b) is multiplied by the subjective evaluation (e) of the behavioral outcome or object attribute, and the resulting products are summed over the number of salient beliefs to determine one's attitude (A). Behavioral beliefs are the foundation upon which attitudes are formed; however, they are not the only type of beliefs which are known to influence behavioral intentions and actual behaviors. Other beliefs, such as normative beliefs and control beliefs, have also been shown to add to the prediction of behaviors.

### 3.1.2 Theory of Reasoned Action

The theory of reasoned action (Fishbein and Ajzen 1975) assumes that behavioral intentions are determined by two independent factors, one of which is attitude toward the behavior, as discussed in the previous section. The additional predictor refers to the consideration of subjective norms, defined as the perceived social acceptability of engaging in a behavior (Ajzen 1991). Subjective norms are based on normative beliefs, which refer to the probability that an important referent person or group (e.g., person's spouse, family, friends, coworkers, etc.) approves or disapproves of the performance of

the particular behavior in question (Gentry and Calantone 2002). Like the expectancy-value model of attitudes, these normative beliefs combine with motivation to determine an overall measure of subjective norms:

$$SN = \Sigma n_i m_i \qquad (2)$$

Specifically, the strength of each normative belief (n) is multiplied by the person's motivation to comply (m), and the subjective norm (SN) is determined by the sum of the products across the number of important referential agents (Ajzen 1991).

The TRA has been shown to adequately predict behaviors that are relatively straightforward and under circumstances where there are no constraints on action. However, when there is the potential of actual or perceived obstacles to performing the behavior, intentions based on one's attitudes and subjective norms may be insufficient to predict behavioral performance. The theory of planned behavior (TPB) was developed to solve this problem inherent in the TRA.

### 3.1.3 Theory of Planned Behavior

The theory of planned behavior (Ajzen 1991) has emerged as one of the most influential and popular conceptual frameworks for the study of human behavior (Ajzen 2001, 2002). According to the TPB, people act in accordance with their intentions and perceptions of control over the behavior, while intentions are influenced by attitudes toward the behavior, subjective norms, and perceptions of behavioral control. The difference between the TPB and its predecessor, the TRA, is the addition of perceived behavioral control (PBC), which allows for the prediction of behaviors that are not under

complete volitional control. Performance of these types of behaviors may depend on other factors such as the availability of opportunities and facilitators such as time, money, and expertise.

Perceived behavioral control refers to a person's perception of his or her ability to perform a given behavior. Drawing again from the expectancy-value model of attitude, it is assumed that perceived behavioral control is determined by control beliefs, which are defined as beliefs that have to do with factors that either assist or impede with performance of the behavior (Ajzen 1991). Just as beliefs concerning consequences of a behavior are viewed as determining attitudes toward the behavior and normative beliefs are viewed as determining subjective norms, beliefs about resources and opportunities are viewed as underlying perceived behavioral control:

$$PBC = \Sigma c_i p_i \qquad (3)$$

In this equation, each control belief (c) is multiplied by the perceived power (p) of the particular control factor to facilitate or inhibit performance of the behavior, and the resulting products are summed across the n salient control beliefs to determine the perception of behavioral control (Ajzen 1991).

### 3.2 Summary of the Development of Attitude Theory

Overall, the reasoned action approach to behavioral prediction has gained much validity over the years (Ajzen and Fishbein 2004). For example, in a meta-analysis based on 185 independent studies (Armitage and Conner 2001), the TPB was found to account on average for 39% of the variance in intentions and 27% of the variance in behavior.

This suggestion is also supported by research that employs structural equation modeling (SEM) with variables included in the TPB. The findings reported usually indicate a high proportion of explained variance once measurement unreliability is taken into account as well as good fit between the model and the data, particularly in the context of health-related behaviors (e.g., Blue, Wilbur and Marston-Scott 2001; Levin 1999). However, these studies often do not account for the influences of method biases, specifically, common method variance in studies conducted within the frameworks of the TRA and TPB.

Behavioral decision-making models such as the TRA and TPB have tended to rely on self-report data (Armitage and Conner 2001). In addition, in most applications, measures of beliefs, overall evaluations, intentions, and even past behaviors are taken with the same or very similar (bipolar or unipolar) evaluative rating scales. Concerns regarding the use of self-reports and the pervasiveness of common method variance are common to reviews of questionnaire-based studies and are indicative of a wider debate within the academic literature (Ajzen and Fishbein 2004; Armitage and Conner 2001). The fear is that since individuals' reports of their various internal states (cognitions, affect, attitudes, intentions, etc.) are collected at the same time using similar measures, method variance may inflate the observed correlations between the constructs. The goal of this essay is to provide an objective assessment of CMV in past marketing research within the framework of studies based on the reasoned-action paradigm of attitudes.

# CHAPTER 4

# METHODOLOGICAL CONCERNS WITH ATTITUDE MEASUREMENT

Method biases occur when investigators are unable to disentangle the variance that is attributable to the actual phenomena of interest from the variance that is a by-product of the particular measure or instrument that was used to collect that data (Podsakoff et al. 2003; Spector 1987). The presence of method variance is a source of systematic error that may bias the observed correlations between variables (Bagozzi and Yi 1993; Lindell and Whitney 2001). To the extent that method variance accounts for a sizeable amount of the shared variance among self-report measures included on a survey, it is possible that incorrect substantive conclusions will be made pertaining to the relationships among the variables (Campbell 1982). One possible outcome is that the results may suggest relationships (significant correlations between variables or significant path estimates in a model) that would not be significant once method variance is accounted for. In addition, effect sizes may be overestimated (e.g., inflated SMCs; Kemery and Dunlap 1986).

One situation in which method variance is likely to artificially inflate the correlations among variables included in a study is when they are all assessed using one type, or a few very similar types, of self-report measurement scales (e.g., Likert scales and semantic differential scales). This leads to the potentiality of common method variance (CMV), which is defined as the amount of spurious covariance shared by measures specifically because of the common context in which the measures are collectively elicited (Buckley, Cote, and Comstock 1990; Podsakoff et al. 2003).

Common method bias typically occurs when all of the variables are measured at the same or very close points in time. Podsakoff et al. (2003) recently categorized the origins of common method variance more specifically into common source effects, item characteristic effects, and item context effects.

## 4.1 The Influence of Common Method Variance (CMV) in Survey Research

Common method variance is one of the most frequently mentioned methodological concerns pertaining to survey research among social scientists in general (e.g., Donaldson and Grant-Vallone 2002; Harrison, McLaughlin and Coalter 1996; Williams and Brown 1994), and among marketing researchers in particular (e.g., Bagozzi and Yi 1993; Ghosh and John 2005; Im and Workman 2004). Although marketing researchers recognize a need to account for CMV, there is very little objective evidence that estimates the influence of such biases in published studies. After reviewing the available literature, it is apparent that the extent to which CMV impacts research conclusions remains ambiguous. There is support both for (e.g., Glick, Jenkins, and Gupta 1986; Harvey, Billings, and Nilan 1985; Wagner and Gooding 1987) and against (e.g., Malhotra, Kim, and Patil 2006; Spector 1987) the substantial inflation of correlations due to CMV.

### 4.1.1 CMV in Marketing Research

It has been shown that common method biases tend not to be uniform across constructs or across research domains and many researchers have called for domain-specific research in this area (Cote and Buckley 1987; Crampton and Wagner 1994; Donaldson and Grant-Vallone 2002). In the marketing literature, Cote and Buckley (1987) examined the influence of CMV by using confirmatory factor analysis (CFA) to

disentangle trait, method, and random error variance in social science studies that had used Campbell and Fiske's (1959) multi-trait multi-method (MTMM) analysis. The authors found that on average, measures contained 42 percent true score variance, 26 percent method variance, and 32 percent random error variance, although these percentages varied across context. However, given the limitations of the study attributable to its limited sampling frame and use of CFA, as well as the fact that almost two decades have past since its publication, a more contemporary and comprehensive investigation of common method variance in the marketing literature is warranted.

The present study is an attempt to infer from previously published studies the effects of CMV on correlations between variables within the framework of what can generally be though of as attitude theory. Because there are numerous studies in the marketing literature that are founded upon attitudinal frameworks and because the constructs are applicable in a number of contexts (e.g., advertising evaluation, salesperson satisfaction, product choice, referral intentions, etc.), we focus our analysis on studies that are supported by the Fishbein and Ajzen (1975) paradigm.

### 4.1.2 Assessing CMV within the Framework of Attitude Theory

It has been suggested a number of times that the presence of common method variance tends not to be uniform across constructs or domain areas (Donaldson and Grant-Vallone 2002; Glick, Jenkins, and Gupta 1986). In both Feldman and Lynch (1988) and Lindell and Whitney (2001), the authors point out the need for more studies on common method variance, especially in specialized settings and research areas in which context effects are likely.

One reason why this study is framed around the TRA and TPB and the constructs contained within is because findings from these studies seem especially susceptible to common method bias. First, when designing a study used to predict behavior, assess behavioral intentions, or elicit evaluations, the researcher is encouraged to create measures of each of the constructs that explicitly match in their levels of specificity (Fishbein and Ajzen 1975), which makes them especially susceptible to the influences of CMV. The influence of measurement in the context of the TRA and TPB has also been demonstrated in prior research. Ryan (1982) found that the procedures used to measure attitudinal variables may explicitly account for measurement error that can bias structural model results. Specifically, he argues that the similarity of items on a cross-sectional paper-and-pencil survey will produce CMV, thereby biasing latent variable relationships upward as suggested by the study findings.

The second reason for choosing to focus on reasoned-action theories is consistent with Fishbein and Ajzen's (1975) assertion that their model can be used to understand and predict most human behavior. Sheppard, Hartwick, and Warshaw (1988) conducted a study to examine the robustness of the Fishbein paradigm. They found that when the model was used to investigate activities for which the model was not originally intended, it performed extremely well in the prediction of goals and in the prediction of choice activities. Therefore, even when utilized to investigate situations and activities that do not fall within the boundary conditions originally specified for the model, it still seems to have strong predictive utility (Sheppard, Hartwick, and Warshaw 1988). In addition, Davis, Bagozzi, and Warshaw (1989) note that a key assumption of the TRA is that all other factors that influence behavior do so indirectly, by influencing attitudes, social

norms, or other variables included in the model. Thus, the internal TRA and TPB variables can also be used as a common frame of reference to integrate various research studies.

# CHAPTER 5

# MEASURING AND CONTROLLING FOR CMV

In this section of the essay, a sample of the various ways to control for common method variance and some of the advantages and disadvantages associated with each of these techniques is introduced. The use of the marker-variable technique to reanalyze published research results is also justified.

## 5.1 Multi-Trait Multi-Method Analysis

Campbell and Fiske (1959) developed a procedure for detecting method variance using a multi-trait multi-method (MTMM) analysis. In order to conduct a traditional MTMM analysis, researchers must measure each of the constructs of interest using more than one method. The pattern of intercorrelations among the measures constituting the MTMM matrix can be used to test for convergent validity, discriminant validity, and the presence of method variance. One conventional indicator of CMV is estimated by the difference between the monomethod-heterotrait (MH) correlations and the heteromethod-heterotrait (HH) correlations. Assuming that convergent validity has been demonstrated (the tendency of alternate measures of the same construct to correlate), CMV is assumed to be present if the MH correlations are significantly greater than the HH correlations (Campbell and Fiske 1959; Millsap 1990).

This procedure of comparing correlations in a MTMM matrix to assess construct validity and the existence of common method effects has several limitations. First, the presence of common method variance may inflate diagonal values in the matrix, which increases the probability of the data meeting Campbell and Fiske's (1959) criteria for

convergent and discriminant validity (Peter 1981). In addition, one assumption underlying this type of analysis is that the different methods used are maximally dissimilar or uncorrelated (Williams, Cote, and Buckley 1989). In reality, however, the methods might not be that much different, which would lead to the HH correlations being similar to the MH correlations. This is because the heteromethod and monomethod 'triangles' in the MTMM matrix will both contain common method variance. In this case, subtracting HH correlations from MH correlations will remove both shared trait variance and shared method variance, causing the difference between the values to be minimal even though common method variance may exist (Millsap 1990; Williams, Cote, and Buckley 1989).

A more practical limitation of MTMM analysis has to do with the requirement that each of the constructs be measured using at least two different methods. This forces the researcher to use at least twice as many measures as a conventional research design, which may lead to decreased response rates and forced limitations in the scope of the study (Lindell and Whitney 2001; Malhotra, Kim, and Patil 2006). Another limitation with MTMM analysis refers to the fact that it does not allow for a direct estimate of the exact level of CMV present in the study. To estimate, and thus control for, a precise level of CMV, researchers must use a more advanced procedure such as confirmatory factor analysis.

### 5.2 Confirmatory Factor Analysis

An additional approach to assessing common method variance uses confirmatory factor analysis (CFA) (Marsh and Hocevar 1988). The MTMM-oriented CFA procedure, unlike the traditional MTMM analysis, gives unique estimates of trait, method, and error

variance present in the correlation or covariance matrix (Bagozzi and Yi 1990, 1993). The CFA procedure is based on the assumption that the first unrotated factor derived from a principal components analysis extracts the greatest proportion of common method variance across all variables (Kemery and Dunlap 1986; Podsakoff and Todor 1985). To determine whether any meaningful relationships exist after accounting for CMV, the first unrotated factor is partialled out of all the correlations among variables and the relationships of interest are again examined for significance.

One problem with this method is that by partialling out the first common factor, one may remove true score variance along with any common method variance that is present (Kemery and Dunlap 1986; Podsakoff and Todor 1985). Therefore, the actual levels of relationships among variables probably lie somewhere between that which is present before the common method factor is partialled out, and that which is present after it is partialled out. Thus, this method provides a conservative estimate of the relationships between predictor and criterion variables (Podsakoff and Todor 1985). A second limitation of using CFA is that it may lead to spurious negative correlations after the method variance is partialled out, which may be statistically significant when the sample size is large and the original correlation is near zero (Kemery and Dunlap 1986). Another limitation is related to the additive assumption underlying the CFA approach such that variation in the measures can be attributed to a linear combination of traits, methods, and errors. However, in certain contexts, traits and methods may interact to determine the variation in a particular measure (Bagozzi and Yi 1990). If methods do have multiplicative effects, then the CFA model would be inappropriate for examining the

particular influence of CMV. The direct product model was developed to account for this deficiency.

### 5.3 Direct Product Model

The direct product model assumes multiplicative, rather than additive, method effects (Campbell and O'Connell 1967). In other words, as the relationship between traits increases, the influence of method variance also increases. This is in contrast to the assumption made in the CFA analysis that CMV effects are constant across variables. Bagozzi and Yi (1990, 1993) demonstrated the presence of multiplicative effects and argued for the use of a direct-product model (DPM) to represent the interaction of traits and methods. Specifically, the DPM hypothesizes multiplicative effects of methods and traits such that sharing a method exaggerates the correlations between highly correlated traits relative to traits that are relatively independent. However, like the traditional MTMM and CFA, the DPM also relies on the costly approach of measuring constructs using multiple methods.

### 5.4 Harmon's One Factor Test

Unlike the methods mentioned above, Harmon's one-factor test is useful for assessing CMV in a single-method research design (Podsakoff and Organ 1986; Podsakoff et al. 2003). In this procedure, all of the variables of interest are entered into an exploratory factor analysis (EFA). If a single factor appears to emerge from the unrotated factor solution or if the first factor accounts for the majority of the variance, then common method variance may be present.

Problems with this method are related to the fact that as the number of variables included in the study increases, the probability of finding more than one factor also

increases. Thus, if moderate or small levels of CMV are present, then it is less likely that it will be detected because CMV will not account for the majority of the variance in the manifested variables (Kemery and Dunlap 1986; Podsakoff et al. 2003). This problem may result in the underestimation of CMV biases. In addition, similar to the CFA procedure described above, the first factor is likely to incorporate true score variance in addition to CMV. Thus, it is possible that functional relationships will be overlooked because they are attributed to the effects of common method bias (Kemery and Dunlap 1986; Lindell and Whitney 2001; Podsakoff and Organ 1986).

### 5.5 Marker-Variable Technique

Lindell and Whitney (2001; see also Lindell and Brandt 2000) proposed a relatively novel approach to quantitatively assess the effects of common method variance. Using this method, the researcher includes a special marker variable into the design of the study that is theoretically unrelated to at least one of the variables of interest. The a priori assumption is that the correlation between the marker-variable and the unrelated variable should be equal to zero. After data collection, the correlation between the marker-variable and the theoretically unrelated variable ($r_S$) can be used to estimate the effect of CMV. Under this assumption, a researcher can recalculate the correlation of a predictor variable with a criterion variable after the effects of CMV have been controlled. The influential effects of CMV can be assessed by whether or not the originally significant correlations are reduced to statistical nonsignificance once CMV has been partialed out.

Alternatively, the marker-variable technique may be used in a post hoc fashion when a theoretically unrelated variable is not set aside a priori (Lindell and Brandt 2000; Lindell and Whitney 2001). A reasonable proxy for $r_S$ as described above is the smallest

correlation among the manifest variables included in a study ($r_{M1}$). This is a reasonably conservative estimate of CMV bias, mostly because the correlation may be influenced by true score variance as well as CMV. Because the post hoc approach does have the potential of capitalization upon chance factors, researchers can also use the second smallest correlation ($r_{M2}$) as an even more conservative estimate of CMV. While this estimate may slightly overestimate the actual amount of CMV present in the data, its upward bias is smaller than that of the common method factor used in Harman's test (Lindell and Whitney 2001).

Malhotra, Kim and Patil (2006) recently conducted a study to empirically compare alternative methods to assess CMV and to test the validity of the assumptions inherent in the use of the marker-variable technique; particularly that one estimate of method variance is used in the reestimation of a set of parameters derived from a single study. In this study, the authors prepared two versions of a survey questionnaire, one web-based and one paper-and-pencil. This allowed them to compare multiple techniques (single-factor CFA, marker-variable technique, MTMM, and CFA-based MTMM) that have been used to estimate the extent of CMV in collected data. The Web version was used to test the single-method techniques for assessing CMV, for example, Harman's single-factor and the marker-variable technique. The paper-and-pencil version was used to test the multiple-method techniques, specifically MTMM and CFA-based MTMM. The results of this study (n = 227) show that "the marker-variable technique appears to be quite robust in violation of its major assumption that the indicators are equally influenced by the common method factor" (Malhotra, Kim, and Patil 2006, p. 1871). In fact, the overall CMV levels and reestimated parameters based on the use of the marker-variable

technique were fairly consistent with those derived from a CFA-based MTMM even though the CFA showed that factor loadings attributable to the method factor varied across construct indicators. These findings support that the marker-variable technique can be quite reliable in estimating the influence of CMV even when the key assumptions are not met exactly (Lindell and Whitney 2001).

To use the marker-variable technique in a post hoc fashion, an estimate of $r_S$ (e.g., $r_{M1}$) is partialled out from the uncorrected correlation ($r_U$) between a predictor and criterion variable in order to arrive at a CMV-adjusted correlation ($r_A$). In particular, with a sample size of n, $r_A$ and its corresponding t-statistic can be calculated as follows:

$$r_A = (r_U - r_M) / (1 - r_M) \quad (4)$$

$$t_{\alpha/2,n-3} = r_A / (\sqrt{((1 - r_A^2) / (n - 3))}) \quad (5)$$

Using Equations 1 and 2, researchers can examine the impact of CMV on the magnitude and significance of a correlation. In addition, it is possible to complete an entire matrix of CMV-adjusted correlations using these equations and the original correlations. This correlation matrix can then be used as input for path analysis to acquire CMV-adjusted path coefficients and explained variance (Jöreskog and Sörbom 1996).

The use of a marker-variable analysis is advantageous because unlike the traditional MTMM analysis, it will produce a specific estimate of CMV along with the statistical significance of the effect. In addition, the researcher does not have to employ the use of multiple methods, as is necessary when using the MTMM or CFA analyses. It

is also a significant improvement over CFA because it does not partial out the first factor, which is likely to severely overstate the impact of CMV. In addition, the single-factor test requires raw data for analysis; however, the marker-variable technique can be performed using a correlation matrix, which makes it more convenient in post hoc analyses. Thus, the marker-variable method seems to be an appealing alternative to the assessment of method biases in general and those in previously published studies in particular.

# CHAPTER 6

# REANALYSIS OF CORRELATIONS

To better understand the potential influence of common method variance in marketing research, the results of previously published studies based on the reasoned action framework are reanalyzed using the marker-variable technique. First, this section describes how the studies used in the marker-variable analysis were selected. Second, the results of the marker-variable analysis are reported. Third, the results of a sensitivity analysis are presented. Finally, the likelihood that an originally statistically significant correlation becomes statistically nonsignificant once adjusted for CMV is investigated using a logit analysis.

## 6.1 Selection of Individual Studies

To identify the studies to which the marker-variable technique was applicable and the constructs of interest were within the framework of the reasoned-action approach, all issues of the following journals from 1994 to Spring of 2005 were examined: *Journal of Consumer Research, Journal of Marketing Research, Journal of the Academy of Marketing Science, Journal of Marketing, Psychology and Marketing, Journal of Consumer Psychology, Journal of Retailing, Journal of Business Research,* and *Journal of Public Policy and Marketing*. The focus was only on published studies because the intent is not to summarize the results of attitude research but to investigate potential biases within published research in this context. A study was included in the analysis if (1) both predictor and criterion variables were collected using a single self-report questionnaire and (2) the correlations between the research variables were reported. In

addition, the dependent variables that were studied had to be either attitudinal (e.g., job/product satisfaction, advertising evaluation, etc.), a measure of intentions (e.g., purchase intention, intention to quit), or a self-report of actual behavior. This selection process yielded a total of 78 papers, specifically, three from *Journal of Consumer Research*, four from *Journal of Marketing Research*, eleven from *Journal of the Academy of Marketing Science*, twelve from *Journal of Marketing*, nine from *Psychology and Marketing*, one from *Journal of Consumer Psychology*, ten from *Journal of Retailing*, 27 from *Journal of Business Research*, and one from *Journal of Public Policy and Marketing*.

From the 78 selected papers correlations were identified to be included in the marker-variable analysis. The relationships between independent and dependent variables are typically hypothesized and tested for significance, thus, it is important to check whether those relationships that were originally significant become nonsignificant once adjusted for CMV. Thus, only the correlations between the independent variables and dependent variables (of interest) that were statistically significant at the level of .05 (two-tailed) were included in the study. This yielded a total of 663 significant correlations that were subject to the subsequent analyses.

### 6.2 Results of the Marker-Variable Analysis

As recommended by Lindell and Whitney (2001), $r_{M1}$ was first used as an estimate of $r_M$. However, to minimize capitalization on chance that the use of $r_{M1}$ might result in, $r_{M2}$ was also used as a more conservative estimate of $r_M$. Using both estimates of $r_M$, CMV-adjusted correlations and their significance were calculated using Equations 1 and 2, respectively. Note that in this analysis, the variables were assumed to have no

measurement errors. This is because many of the published studies did not report exact reliability estimates for all of the variables that were measured. This should also increase the conservative nature of the estimates. A summary of the results of the analysis is shown in Table 1. The results using $r_{M1}$ appear in the column named CMV1, whereas those based on $r_{M2}$ are in the column named CMV2.

**Table 1**
Results of Marker-Variable Analysis

| | CMV Levels | | | | |
|---|---|---|---|---|---|
| | CMV1 | CMV2 | Sensitivity Analysis | | |
| $r_M$ | 0.12 | 0.16 | 0.10 | 0.20 | 0.30 |
| Original Studies: | | | | | |
| Average (n) | 376.46 | 376.46 | 376.46 | 376.46 | 376.46 |
| Average ($r_U$) | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 |
| CMV Adjustments: | | | | | |
| Average ($r_A$) | 0.33 | 0.30 | 0.35 | 0.26 | 0.16 |
| Nonsignificant† | 11.01 | 20.06 | 15.23 | 31.98 | 50.08 |

Notes: $r_U$ = uncorrected correlation; $r_A$ = CMV-adjusted correlation; $r_M$ = a shared correlation resulting from CMV; CMV1 = the first smallest positive correlation in a correlation matrix ($r_{M1}$); CMV2 = the second smallest positive correlation in a correlation matrix ($r_{M2}$); n = sample size. † the percentage of correlations becoming nonsignificant.

When $r_{M1}$ was used as the estimate of $r_M$, the average size of $r_M$ was found to be .12. In addition, the average value of the original correlations (i.e., uncorrected correlations) was .41, and the average value of the CMV-adjusted correlations was .33. As shown in Table 1, of 663 correlations examined, 11.01% became nonsignificant when adjusted for CMV. On the other hand, when $r_{M2}$ was used, the average size of $r_M$ increased to .16. Whereas the average value of the original correlations remained the

same, the average value of the CMV-adjusted correlations was found to decrease to .30. Consequently, of the 663 significant correlations, 20.06% became nonsignificant after accounting for CMV. In general, the results of the marker-variable analysis indicated that a majority of the originally significant correlations would remain significant even after controlling for CMV (i.e., approximately 89% in the case of $r_{M1}$ and 80% in the case of $r_{M2}$).

### 6.2.1 Sensitivity Analysis of the Summary Results

In the above analysis, $r_M$ was estimated using both the first and second smallest absolute values in a correlation matrix. Although this is the procedure described by Lindell and Whitney (2001), it is still possible that the estimated $r_M$ value did not reflect the true amount of CMV. Thus, a sensitivity analysis was conducted to examine how the results of the previous analysis would vary with respect to different estimates of $r_M$. In the literature, it has been reported that approximately 20% to 25% of the variance in measures can be attributable to CMV effects (Cote and Buckley 1987; Roth, Hearp, and Switzer 1999; Williams, Cote, and Buckley 1989). This marker-variable analysis considers more extreme cases in which $r_M$ is estimated at .30. Accordingly, the sensitivity analysis is conducted by varying $r_M$ from .05 to .30 in steps of .05.

The results of the analyses corresponding to three different levels of $r_M$ are shown in Table 1. As expected, CMV effects on the magnitude of the correlation coefficients and their significance were not substantial when the estimated $r_M$ value was less than or equal to .10. When $r_M = .10$, the difference between the average of the original correlations and that of the CMV-adjusted correlations was less than .06. Consequently, the probability of a correlation becoming nonsignificant was found to be approximately

15%, suggesting that a majority of the corrected correlations would remain statistically significant at this range of $r_M \leq .10$.

As $r_M$ increased to .20, the biases resulting from CMV became more evident. For example, when $r_M = .20$, the average of the CMV-adjusted correlations decreased to .26. In addition, approximately 32% of the correlations became nonsignificant. Nevertheless, these results also indicate that even at this relatively conservative level of $r_M$, more than two-thirds (68%) of the corrected correlations remained significant. Note that based on Equations 4 and 5, the size of the unadjusted correlation is critical in determining the likelihood that the correlation remains significant after controlling for CMV. Given this, our results imply that if an uncorrected correlation is relatively large, the CMV-adjusted correlation of interest will remain significant. For example, when sample size is about average (e.g., n = 376), the average size of a correlation (e.g., $r_U = .41$) will remain significant even after taking into account the $r_M$ level of .20 (e.g., $r_M = .20$, $r_A = .26$, $p < .0001$). Thus, it can be concluded that as long as uncorrected correlations are moderately strong (e.g., $r_U \geq .40$), research findings based on the original correlations will hold against a relatively high level of CMV (e.g., $r_M = .20$).

On the other hand, in the more extreme condition in which when $r_M = .30$, the average of the CMV-adjusted correlations (.16) was less than 40% of its original correlation (.41). As shown in Table 1, more than 50% of the correlations became nonsignificant when CMV biases were controlled for at a level of $r_M = .30$.

### 6.3 Logit Analysis

Some researchers have shown that CMV effects vary across study context or research domains (Cote and Buckley 1987; Crampton and Wagner 1994). Thus, an

important question to consider is whether CMV biases differ across variables typically measured within the framework of attitude theory. For example, it is possible that the likelihood of a CMV-adjusted correlation becoming nonsignificant changes from one area of interest (e.g., research on customer attitudes) to another (e.g., research on customer satisfaction). This section examines if the probability of a correlation becoming nonsignificant will vary with respect to different types of dependent variables.

First, a model of the likelihood of an original correlation becoming nonsignificant when adjusted for CMV was developed. A logit model is specifically suited to predict the probability that an event occurs (Hair et al. 1998). In this case, the logit model included seven dependent variables that were most frequently investigated among the selected articles. Those variables were attitude, evaluation, satisfaction, job satisfaction, purchase intention, behavioral intention, and turnover intention. Each of the variables was specified as a determinant that could potentially influence the likelihood of a correlation becoming nonsignificant. In addition, the logit model included three key parameters of Equations 4 and 5 as control variables, specifically, $r_U$, $r_M$, and n. The key question here is whether the types of dependent variables would offer additional explanatory power over and above the three known determinants. The specific form of the logit model is:

$$\log_e (P/(1-P)) = \Sigma a_i X_i \qquad (6)$$

where P is the probability of a CMV-adjusted correlation becoming nonsignificant, $X_i$ denotes a determinant variable, and $a_i$ indicates a coefficient. Note that if $a_i$ is positive, P will increase as $X_i$ increases; if it is negative, P will decrease as $X_i$ increases; if it is 0, no

change in P will occur regardless of $X_i$. We conducted eight logit analyses – one each for $r_{M1}$, $r_{M2}$, and the six hypothetical $r_M$ levels used in the previous sensitivity analysis. The results including parameter estimates and model fit are described in Table 2.

**Table 2**
Results of Logit Analysis

| | CMV Levels | | | | |
|---|---|---|---|---|---|
| | CMV1 | CMV2 | Sensitivity Analysis | | |
| $r_M$ | 0.12 | 0.16 | 0.10 | 0.20 | 0.30 |
| Parameter Estimates: | | | | | |
| ATT | 1.21 | 0.94 | 0.76 | 0.90 | 1.73 |
| EVAL | 4.38** | 3.65** | 1.39 | 1.07 | 0.02 |
| SATIS | 2.44 | 0.54 | -0.04 | 0.23 | 0.23 |
| JSATIS | 1.35 | 1.23 | -0.77 | 0.11 | 0.17 |
| PINTENT | 2.38 | 1.36 | 0.64 | 0.66 | 0.17 |
| BINTENT | 2.02 | 0.32 | 0.23 | 0.17 | 0.99 |
| TINTENT | 1.26 | 0.41 | -0.71 | -0.25 | 0.26 |
| $r_U$ | -75.30*** | -77.69*** | -73.80*** | -45.15*** | -36.33*** |
| $r_M$ | 68.39*** | 70.37*** | — | — | — |
| n | -0.01*** | -0.01*** | -0.01**** | -0.00*** | -0.00*** |
| Constant | 8.73*** | 9.95*** | 17.01*** | 14.49*** | 14.84*** |

Notes: ATT = attitude; EVAL = evaluation; SAT = satisfaction; JSATIS = job satisfaction; PINTENT = purchase intention; BINTENT = behavioral intention; TINTENT = turnover intention; $r_U$ = uncorrected correlation; $r_M$ = a shared correlation resulting from CMV; CMV1 = the first smallest positive correlation in a correlation matrix ($r_{M1}$); CMV2 = the second smallest positive correlation in a correlation matrix ($r_{M2}$); n = sample size. *p<0.05, **p<0.01, ***p<0.001 (two-tailed).

As indicated by Nagelkerke's pseudo $R^2$, the logit model fit the data sufficiently for all the levels of $r_M$. Because of this, the parameter estimates from the logit analysis were considered to be credible. As expected, the coefficient corresponding to the size of the original correlation ($r_U$) was negative and significant in all cases. These results can be interpreted to mean that as the size of the original correlation increased in magnitude, the probability that the correlation would become nonsignificant when adjusted for CMV decreased. Similarly, as Table 2 shows, the same rationale applies to the sample size (n). In particular, as the sample size increased, the probability that the correlation would become nonsignificant when adjusted for CMV decreased. Also as expected, the coefficient for the size of the marker variable correlation ($r_M$) was positive and significant for both $r_{M1}$ and $r_{M2}$. This can be interpreted to mean that as the size of the marker variable correlation increased in magnitude, the probability that the correlation would become nonsignificant when adjusted for CMV increased. In the sensitivity analysis, the marker variable correlation was held constant across studies, and therefore, was not included in the analysis.

Regarding the coefficients related to the dependent variable categories, while a few were significant, there were not any substantive conclusions to be made from the results. Of the 56 coefficient estimates (seven variables * eight CMV levels), only four were significant (7.14%), which can largely be attributed to chance. However, three out of these four were associated with the 'evaluation' variable. Although it is possible that, as compared to the other categories examined, the 'evaluation' category may be more susceptible to CMV biases, it should be noted that for five of the eight CMV levels there was no differential effect. Overall, the results of the logit analyses show that once the size

of the uncorrected correlation ($r_U$), the estimate of the marker variable correlation ($r_M$), and the sample size (N) were taken into account, the research domains represented by the seven types of criterion variables had little influence on the probability that correlations would become nonsignificant once CMV was taken into account.

# CHAPTER 7

# REANALYSIS OF PATH ESTIMATES

This section presents an investigation of the extent to which CMV inflates path estimates and explained variance in addition to correlation coefficients. The method is adopted from Malhotra, Kim, and Patil (2006), who were the first to extend the marker-variable technique to structural equation modeling. The first step is to select studies that are appropriate for inclusion in this analysis. The second step is to examine the impact of CMV on correlations, path estimates, and explained variance in the selected studies. The final step is to test the robustness of these results by conducting a sensitivity analysis.

## 7.1 Selection of Individual Studies

Because the construct of intention is a key dependent variable that is often measured in research based on the reasoned-action framework, studies within our original sample that assessed behavioral or purchase intention as a key dependent variable of interest were selected for inclusion in the sub-sample. A smaller sample of studies was used for this analysis mainly because of the greater sophistication and complexity of the method employed. Articles were selected if they reported factor correlations, and each of these latent factors were treated as single-item variables without measurement error. Ten studies were identified for further analysis.

First, Akaah, Korgaonkar, and Lund (1995) empirically examined consumers' attitudes toward direct marketing and the extent to which attitudes determine intentions to purchase from direct marketers (n = 354). Second, Babin and Babin (2001) examined the effects of retail elements on patronage intentions (n = 133). Third, Baker et al. (2002)

tested a conceptual framework of the prepurchase process based on store choice criteria (n = 297). Fourth, Bansal, Irving, and Taylor (2004) studied the drivers of customer switching intentions in the context of auto-repair services (n = 356). Fifth, Hartline and Jones (1996) attempted to determine the specific cues that increase overall perceptions of quality, value, and intentions to engage in word-of-mouth behavior (n = 276). Sixth, Lacher and Mizerski (1994) developed a model of the music consumption experience by using emotional and evaluative responses to predict purchase intention (n = 215). Seventh, Lotz, Shim, and Gehrt (2003) predicted one's intention to engage in formal gift-giving behavior (n = 672). Eighth, Mooradian and Olver (1997) linked consumption-based emotions with consumer satisfaction and the intention to repeat purchase in the context of automobiles (n = 193). Ninth, Shim et al. (2001) predicted both intention to use the Internet to search for information and Internet purchase intention with attitude toward Internet shopping, previous experiences, and perceived behavioral control (n = 684). Tenth, Wakefield and Barnes (1996) predicted consumers' intentions to attend a minor league baseball game based on their responsiveness to sales promotions, which they found to be a function of variety-seeking tendencies, loyalty to the service provider, and perceptions of the value of the service (n = 308).

### 7.2 CMV-Adjusted Correlations, Path Estimates and Explained Variance

Before estimating the impact of CMV on path estimates and squared multiple correlations (SMCs) through a reanalysis, the results of the above studies were replicated using path analysis (Jöreskog and Sörbom 1996). The original correlation matrices were used as inputs and the results were highly comparable to those reported in the selected studies. With a few rare and minor exceptions (mostly likely due to the use of different

estimation techniques), the path estimates were within ±.02 of the original values reported in the studies.

In the original marker-variable analysis, both the first and second smallest correlations ($r_{M1}$ and $r_{M2}$) as published in each study were used as estimates of the level of CMV. However, only $r_{M2}$ was used in this analysis, mainly because it is the more conservative of the two (Lindell and Whitney 2001). The $r_{M2}$ estimate of CMV ranged from .01 to .47 across the ten studies. CMV-adjusted correlations were calculated using Equation 4 and their significance calculated using Equation 5 as described previously. Path analyses were conducted based on the correlations that had been corrected for CMV. This resulted in CMV-adjusted structural relationships and levels of explained variance (SMCs).

As shown in Table 3, 41 originally significant path estimates were analyzed across the ten studies. After adjusting for CMV, the average change in magnitude was approximately equal to .03. Three of the 41 (approximately 7.32%) originally significant path estimates became nonsignificant after being adjusted for CMV. This is most likely due to the magnitude of the three original correlations, which ranged from .09 to .11. Two of these were significant at a level of .05 and one was significant at a level of .01. The average of the 11 original SMCs that corresponded to the 'intention' variable across the ten studies (one study employed two separate 'intention' measures) equaled approximately 45.58%. After adjusting for CMV, the average change was approximately 7.5%. In general, the results of these analyses show that the conclusions made from the original estimates would be relatively comparable to the conclusions made from estimates adjusted for CMV.

**Table 3**
Results of Path Analysis

| | | CMV Levels | | | |
|---|---|---|---|---|---|
| | | Number of originally significant parameters that became nonsignificant after adjusting for CMV | | | |
| | | | Sensitivity Analysis | | |
| Studies: | # of originally significant parameters | $r_{M2}$ | 0.10 | 0.20 | 0.30 |
| Akaah, Korgaonkar, and Lund (1995) | 5 | 0 | 0 | 0 | 0 |
| Babin and Babin (2001) | 3 | 1 | 1 | 1 | 2 |
| Baker et al. (2002)† | 6 | 0 | 0 | 0 | 0 |
| Bansal, Irving, and Taylor (2004) | 2 | 0 | 1 | 1 | 1 |
| Hartline and Jones (1996) | 6 | 1 | 0 | 0 | 0 |
| Lacher and Mizerski (1994) | 4 | 0 | 0 | 0 | 0 |
| Lotz, Shim, and Gehrt (2003)†† | 3 | 0 | 2 | 2 | 2 |
| Mooradian and Olver (1997) | 3 | 0 | 0 | 0 | 0 |
| Shim et al. (2001) | 6 | 1 | 0 | 1 | 2 |
| Wakefield and Barnes (1996) | 3 | 0 | 0 | 1 | 3 |

Notes: $r_M$ = a shared correlation resulting from CMV. † This analysis was based on Study 1; †† This analysis was based on the formal gift-giving model

### 7.2.1 Sensitivity Analysis of the Summary Results

Although one can argue that $r_{M2}$ is a reasonable estimate of CMV, there is the possibility that this value does not accurately portray the true amount of CMV reflected in the data. A sensitivity analysis is conducted here to test the robustness of the results of the reanalysis with respect to different values of $r_M$. We followed the same sequence of analyses as discussed above, but the level of $r_M$ was varied from .05 to .30 in increments of .05. The path estimates determined under the assumption that $r_M = 0$ remained relatively robust against a fairly wide range of CMV biases. Four out of the 41 originally significant path estimates (approximately 9.8%) became nonsignificant when $r_M = .05$. Four (approximately 9.8%) also became nonsignificant when $r_M = .10$. When $r_M$ increased to .15, five (approximately 12.20%) of the path estimates became nonsignificant. Six (approximately 14.63%) became nonsignificant at the level $r_M = .20$. Seven path estimates (approximately 17.07%) became nonsignificant when $r_M = .25$ and when $r_M = .30$, ten (approximately 24.39%) of the originally significant path estimates became nonsignificant. Concerning explained variance, differences in the SMCs between the original and adjusted values were not substantial at relatively low levels of CMV (e.g., $r_M \leq .20$); however, there were noticeable differences at higher levels of CMV. The average of the original SMCs (45.58%) decreased to 40.16% when $r_M = .10$, 34.16% when $r_M = .20$, and 26.95% when $r_M = .30$.

# CHAPTER 8

# CONCLUSIONS FROM PART ONE

The goal of this part of the dissertation was to examine whether or not the effects of CMV in marketing research would invalidate published findings within the context of attitude theory. A relatively new method called the marker-variable technique was used in a post hoc fashion to quantitatively assess the presence of CMV within a sample of studies based on the reasoned-action framework. The results of the marker-variable analysis, based on 663 correlations from 78 marketing-related studies, suggest that the average correlation between two theoretically unrelated marketing variables will be approximately .14 (average of .16 and .12) when a same-source survey design is used. However, this level of CMV does not appear to be particularly problematic when one considers the number of significant uncorrected correlations that became nonsignificant once they were controlled for this estimate of CMV. The results show that most of the CMV-adjusted correlations remained significant even after using a conservative estimate of $r_M$ (i.e., approximately 80%), which may help to dispel some of the criticisms of same-source survey designs in marketing research. The sensitivity analysis provides further support for the argument that published results, even without the consideration of CMV, are fairly reliable against a realistic range of CMV biases. The logit analysis confirms that as the size of the uncorrected correlation increases, the sample size increases, or the magnitude of the marker variable decreases, the probability of the original correlation becoming nonsignificant will decrease. In addition, the results of the path analysis are even more robust than those from the correlational analysis, suggesting that it may be

reasonable to conclude that the problem of CMV may not be as pervasive and influential as has been argued in the past.

### 8.1 Theoretical and Practical Contributions

In interpreting the results, the doubly conservative nature of the analyses should be noted. First, the use of both $r_{M1}$ and $r_{M2}$ to estimate the marker-variable correlation ($r_S$) provides a conservative estimate of the level of CMV. Second, not adjusting for the presence of measurement error is likely to further inflate the estimates of CMV. Although it is possible to adjust the CMV-corrected correlations for measurement errors, this method could not be implemented because the majority of the studies analyzed did not report exact reliability estimates for all of the constructs of interest. It should also be noted that the robustness of the parameters estimated by the path analysis is more telling than the significance of the original correlations. Ultimately, the substantive conclusions drawn are influenced much more by the parameters of the causal model than by the original correlations. Furthermore, the magnitude of CMV biases found in the present reanalysis and the interpretation thereof is quite consistent with that of Malhotra, Kim, and Patil (2006) in the information systems domain. The convergence of the results of the current study, which are based on a substantially larger sample of studies and focuses on a separate research domain, compared to those of Malhotra, Kim, and Patil (2006) provide confidence in the use of the marker-variable technique within the context of well-defined models as found in the marketing (Theory of Reasoned Action, TRA) and IS (Technology Acceptance Model, TAM) literatures.

Using Equations 4 and 5, it is possible to figure out a range of values for the original correlation ($r_U$) that will remain significant after being adjusted for the presence

of CMV given a particular sample size. Considering the assumptions of the marker-variable technique, this information can then be used to diagnostically assess the robustness of study results against various hypothesized levels of CMV. For example, assuming a sample size of 350 and an unadjusted correlation of a relatively large size (e.g., $r_U = .40$), even when one considers a relatively extreme CMV estimate (e.g., $r_M = .30$), the original correlation will remain significant ($t = 2.689$, $p < .01$). Thus, researchers may use Equations 4 and 5 and the sample size employed in a particular research inquiry to calculate the so-called 'safe zone' in order to assess the validity of their findings (Malhotra, Kim, and Patil 2006).

The marketing field has invested a great amount of time and effort in theory development and theory building in the area of attitude prediction, specifically around the TRA (Fishbein and Ajzen 1975) and TPB (Ajzen 1991). However, the validity of this research, mainly because of its reliance on questionnaire-based research designs, has been challenged regarding the possibility of CMV biases. Despite these criticisms, there have been only a limited number of studies that quantitatively assess the pervasiveness of common method bias in these types of research designs. This paper is an attempt provide an objective analysis of such effects in the marketing literature by using a relatively new technique to disentangle CMV from true correlations between predictor and criterion variables within the context of attitude theory. The findings of the study show that even after CMV is taken into account, the majority of the relationships between variables as published in these studies based on the reasoned-action framework of attitudes remain significant.

### 8.2 Limitations and Future Research

The above analyses were based on certain assumptions that are inherent in the use of the marker-variable technique. First, a fundamental assumption of the marker-variable technique is that all measurement items included in a study are equally affected by CMV. This may not be the case. However, in their empirical comparison, Malhotra, Kim, and Patil (2006, p. 1872) found that "results based on the marker-variable technique were found to be quite consistent with those based on CFA-based MTMM." In light of these results, the sensitivity analyses that were conducted, and our interest in retrospectively estimating the extent of CMV in studies that have not controlled for method effects a priori, we feel that the use of the marker-variable technique in this study is justified. In addition, the assumption of equal variance may be fairly plausible within the context of our study since measures of predictor and criterion variables are typically similar in terms of semantic content, number of items, focus and scope when collected to test hypotheses within an attitudinal framework (Harrison, McLaughlin, and Coalter 1996).

Another limitation is the possibility that CMV present in the data could actually deflate correlations in some studies (Cote and Buckley 1988; Podsakoff et al. 2003; Williams, Cote, and Buckley 1989), which is a condition that the marker-variable technique does not take into consideration. However, the purpose of this study is to determine whether published results are invalidated once we correct for the presence of CMV using a marker-variable correlation. Thus, the major concern is that of inflation effects due to CMV. There is no cause for concern if a published correlation or path estimate is significant even with deflation effects present. If these estimates were corrected for CMV then the adjusted parameters would actually be higher in magnitude than the originals and remain significant.

Although this is a first step in assessing the influence of CMV in contemporary marketing research, there are other avenues for future research in this area. First, this study only examines the effects of CMV within a limited framework of marketing studies, specifically, those based on reasoned-action theories. However, there are many other domains in the marketing field that are mainly based on single-source cross-sectional survey research which may also be susceptible to the influence of CMV (e.g., personality research, decision making research). Therefore, future research on CMV considering other variables of interest to marketing researchers is warranted.

# PART TWO

# DEVELOPMENT OF THE COMPLEX DECISION STYLE (CDS) SCALE FOR HIGH-STAKES DECISION MAKING AND APPLICATION WITHIN A MODEL OF WOMEN'S INTENTIONS TO USE HORMONE REPLACEMENT THERAPY

# CHAPTER 9

# INTRODUCTION TO PART TWO

This part of the dissertation is intended to improve our understanding of consumer behavior in the context of high-stakes decision making using the tenets of complexity science and the principles of complex systems. The main goal is to develop a scale to measure a consumer's tendency to employ a complex decision style in the conceptualization and negotiation of a high-stakes decision situation. This scale can be used to provide new insights into the differences between consumers in the ways that they process information and the importance of various behavioral inputs. This understanding can be used to tailor decision support systems and marketing communications to better match the individual needs and desires of consumers (or segments of consumers) who are faced with high-states decisions such as choosing whether or not to undergo an elective medical treatment or deciding between financial investment options that involve risk and benefit trade-offs.

The complex decision style (CDS) scale will be developed following the paradigm described by Churchill (1979) and DeVellis (2003). Cognitive style theory and the principles of complexity science will serve as the theoretical base for understanding how consumers may differ in the ways that they conceptually organize and negotiate high-stakes decision situations (Goldstein and Blackman 1978). An individual's cognitive style relates to individually preferred strategies involved in the organization and processing of information. Similarly, decision style is defined as a preferred mode or

mental orientation that is used to conceptualize a decision situation and negotiate the decision process to arrive at an acceptable choice (Sproles and Kendall 1986).

The outline of this essay is as follows. First, the motivations for conducting this study as well as a review of cognitive and decision style theory are discussed. The theoretical foundation for development of the CDS scale, particularly, complexity science theory and the characteristics of complex systems are also reviewed. An initial pool of scale items is generated based on past literature and an exploratory research study using a sample of undergraduate students. These scale items are meant to capture the variance that exists among consumers in the tendency to use a complex decision style in high-stakes decision situations. Next, a structured questionnaire is developed including the pool of initial items and administered to a separate sample of undergraduate students. Psychometric properties (e.g., reliability, convergent, and discriminant validity) of these initial items are tested via an examination of item means and variances, tests of sphericity and sampling adequacy, squared multiple correlations, item-to-total correlations, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) using LISREL (Jöreskog and Sörbom 1996). The predictive validity of the CDS scale is also tested using both a sample of undergraduate students and a normal population sample. Finally, the CDS scale is applied within a conceptual model of consumer choice of elective healthcare treatment, more specifically, women's decisions regarding the use of hormone therapy. Mean-level and structural relationship strength hypotheses based on CDS are developed and tested within the conceptual model.

# CHAPTER 10

# CONSUMER DECISION MAKING

The study of decision making has been of primary interest to consumer behavior researchers for over 30 years (Bettman 1979; Hansen 1972; Howard and Sheth 1969). The magnitude of research on this topic is understandable if one considers the large number of consumer choices concerning the selection, consumption, and disposal of products and services that are made every day. Like any other type of decision one must make, consumption decisions vary in degree of complexity. Most consumer decisions are simple and made without much deliberation either out of habit or through the use of normative decision strategies (Payne, Bettman, and Johnson 1993). However, many other consumer decisions may be perceived as cognitively and/or emotionally complex. For example, consumers are often faced with decisions regarding medical treatments, financial investments, insurance, legal issues, housing, and careers or education that involve both serious risks and benefits.

There is an increasing trend in consumers taking an active role in the process of making important, life-altering decisions such as medical and financial investment decisions (Kahn and Baron 1995). This stems primarily from an increase in the availability and attainability of information that once only experts possessed. Although there has been a great deal of consumer decision research concerning how consumers make low-involvement choices, less is known about how consumers make complex, high-stakes decisions involving risks and benefits (Kahn and Baron 1995). High-stakes decisions are defined as those with subjectively important and risky outcomes (Kahn and

Baron 1995; White 2005). They typically involve access to a wide amount of information, making them complex, and are often also emotionally difficult.

A theoretical understanding of the ways in which individuals tend to think and act in high-stakes decision situations would not only provide insight into the processes underlying consumer choices, but it would also be useful in guiding a variety of strategic marketing decisions, such as the design of decision support systems and the development of communication and education programs (Luce, Payne, and Bettman 1999). To the extent that we are able to measure individual differences in the manner of conceptualization and negotiation of a decision situation, this may aid in the prediction of consumer use and satisfaction associated with various information sources (objective vs. subjective), types of information (expert vs. lay), and framing of information (affect vs. cognition-based) that are made available to the decision maker.

### 10.1 Rational Approach to Consumer Decision Making

For many years, rational or normative decision theory was the dominant framework in economics, political science, finance, marketing, and other fields. The core assumption underlying rational choice theories is that individuals are, or attempt to be, involved and rational decision makers (Edwards 1954). A rational decision maker is one who has well-defined preferences that do not depend on contextual factors, which he or she uses to assign subjective values (i.e., utilities) to each option in a choice set individually (Bettman, Luce, and Payne 1998). Rational choice theory assumes that consumers have the ability to use their assigned utilities to compute which choice option will maximize their received benefit and select according to this calculation. These utilities involve the consideration of (1) the actual (or subjective) value of the benefits to

be gained as a result of the choice, (2) the costs associated with the choice, and (3) the benefits that could have been gained if one had made an alternate choice. In addition, the rational approach to decision making assumes that individual choices are cognitive, deliberate and conscious. These rational models of decision making often ignore decision-maker characteristics and assume individuals process information and arrive at a decision in a similar manner (Leonard, Scholl, and Kowalski 1999).

### 10.2 Information-Processing Approach to Consumer Decision Making

Most research on consumer decision making assumes that individuals are predisposed to adopt some form of a rational system as the basis for the decision process. However, over the years, research in judgment and decision making has demonstrated increasingly more violations of rational choice theory and the importance of behavioral influences on choices is now widely studied in a variety of fields (Mellers, Schwartz, and Cooke 1998). As an alternative to rational choice theory, the information-processing approach to the study of consumer choice (e.g., Bettman 1979) argues that consumers make decisions using a wide variety of processing strategies, ranging from normative procedures to more heuristic procedures (Gilovich, Griffin and Kahneman 2002; Kahneman, Slovic, and Tversky 1982; Luce, Bettman, and Payne 1997). In other words, under this view, consumer decision behavior "is shaped by the interaction between the properties of the human information-processing system and the properties of task environments" (Bettman, Luce, and Payne 1998, p. 187). Consumers often act as adaptive decision makers and their preferences are highly dependent on person-, context-, and task-specific factors (Bettman, Luce, and Payne 1998; Lichtenstein and Slovic 1971; Loewenstein et al. 2001; Luce 1998; Luce, Bettman, and Payne 1997; Payne, Bettman,

and Johnson 1993; Simonson 1989; Slovic 1995; Swait and Adamowicz 2001; Tversky 1969). Thus, in addition to the characteristics of the decision task itself, responses to a choice situation may also be influenced by individual differences.

### 10.3 Individual Differences in Decision Making

As described above, there has been a shift in decision making research. Under the rational or normative approach to decision making, theorists depicted individuals as behaving in a strict and automatic stimulus-response (S-R) manner. However, under the behavioral or information-processing approach to decision making, intermediary processes that occur within the individual mediate the relationship between stimuli and responses. The stimulus-organism-response (S-O-R) approach maintains that behavior may be better understood and predicted by studying these individual differences or processing styles (Goldstein and Blackman 1978).

One of the mediating processes of much interest between stimulus and responses is individual cognition. Most of the research on cognition is conducted under the assumption that individual information processors respond to a cognitive representation or construction of the environment rather than responding to objective reality (Zajonc 1968). Kelly (1955) also argued that individuals are consistently in a cognitive state of actively organizing and making sense of the world around them. Kelly (1955) was one of the first to give meaning to the idea of a construct. Kelly's (1955) notion of a construct was as an individual representation of one's environment, including the information contained in it. Thus, instead of merely responding to an environment in the same, robotic-like manner, individuals may represent the same environment in various ways

due to individual differences, which in response, may lead to different behavioral reactions.

# CHAPTER 11

# COGNITIVE STYLE THEORY

Information processing style, often termed cognitive style, is one type of individual difference variable that may influence an individual's representation of his/her environment and the information contained in it. This individual characteristic is often linked to differences in the way in which individuals conceptualize and process information in decision situations and decision making behavior. Found below is a brief review of (1) definitions of cognitive style, (2) approaches to conceptualizing cognitive style, and (3) approaches to measuring/assessing cognitive style.

## 11.1 Definition of Cognitive Style

Goldstein and Blackman (1978, p. 2) conceptualize cognitive style as one of the hypothetical constructs that mediate between stimulus and response. Their definition of cognitive style refers to "the characteristic ways in which individuals conceptually organize the environment." Harvey (1963) similarly defined cognitive style as the way an individual filters and processes stimuli so that the environment takes on psychological meaning. Messick (1976, 1984) and Guilford (1980) define cognitive style by drawing on these two previous definitions – as an individual preference regarding the manner of organizing and processing information.

Kirton (1976) defines cognitive style as it relates to the individual's preferred cognitive strategies involved in change and strategies of creativity, problem solving, and decision making. Kirton's (1976) theory (i.e., Adaptation-Innovation Theory) assumes that cognitive style is conceptually independent to (1) cognitive capacity, (2) cognitive

success, (3) cognitive technique, and (4) coping behavior. In other words, cognitive style is bipolar, non-evaluative, relatively unalterable, and relatively consistent (Kirton 1976). Although many definitions of cognitive style have been adopted, it is generally viewed as a relatively stable disposition which leads to differences in behavior, including differences in decision making behaviors (Leonard, Scholl, and Kowalski 1999).

## 11.2 Approaches to Studying Cognitive Style

There are numerous definitions and measures of cognitive style, which has led to some confusion regarding our understanding of this individual difference variable (Leonard, Scholl and Kowalski 1999). However, the construct is useful in that it is a measurable variable which can be used to describe differences in information processing. One important point to keep in mind is that cognitive style is conceptualized as being independent of cognitive complexity or ability. In other words, alternative styles are conceptualized as equal in the sense that one style is not better or worse than another; they are simply different.

### 11.2.1 Jung's Personality Type Theory

In the early 1900s, Jung first presented his cognitive style theory in the book *Psychological Types,* which was a result of his efforts to understand individual differences among people. Jung's (1923) theory assumes that individuals' personalities serve a variety of functions. First, there is a perceiving dimension. This dimension is concerned with the ways we initially process information that we receive. The perception dimension ranges from sensing (S) to intuition (N). Sensing types prefer facts, details and structure and are practical, realistic, and present-oriented. They also like to solve problems in standard ways. On the other hand, intuition types appreciate an overall

meaning of a situation and show a greater concern for implications rather than raw facts. They are imaginative and able to quickly recognize relationships in data. They also like to solve problems by relying on hunches and spontaneity.

Personality also incorporates a judging dimension, which characterizes our approach to decision making or our evaluation of information in a problem-solving context (the first dimension relates more to the collection of information). This dimension ranges from so-called 'thinkers' (T) to 'feelers' (F). Individuals who judge by thinking are objective and logic-oriented. They tend to be fairly unemotional and in control and carefully consider all options in decision making. On the other hand, individuals who judge by feeling are more personal and value-oriented. They emphasize group values and subjective impressions and generally prefer collaboration with others.

The third dimension is an attention dimension, which defines preferences for internal versus external focus, or more general attitudes or orientations toward life (Leonard, Scholl & Kowalski 1999). This dimension ranges from extraverts (E) to introverts (I). Extraversion refers to a focus on external stimuli where individual attention is directed to the objects and people in one's environment. Introversion, on the other hand, refers to a focus on internal processes, concepts, and ideas.

#### 11.2.1.1 Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI) is a personality inventory that is theoretically founded upon Jung's personality typology (Myers 1962; Myers and McCaulley 1985). This personality measurement instrument is widely used in counseling, education, and industrial environments. In their instrument, Myers and Briggs introduced an additional dimension called judging (J) – perceiving (P), which describes an

individual's preference for organizing or controlling one's external environment (judging) or for understanding these events (perceiving). Thus, the MBTI measures personality on four dimensions: sensing-intuition, thinking-feeling, introversion-extraversion, and perceiving-judging. The low end of each scale is anchored by sensing (S), thinking (T), extraversion (E), and judging (J) and the high end is anchored by intuition (N), feeling (F), introversion (I), and perceiving (P).

### 11.2.2 Harvey, Hunt and Schroder's Processing Styles

In Harvey, Hunt and Schroder's (1961) *Conceptual Systems and Personality Organization* and later Schroder, Driver, and Streufert's (1967) *Human Information Processing*, the argument is that people engage in two tasks when they encounter sensory inputs from the environment. The first of these activities is differentiation, which refers to an individual's ability to place stimuli along dimensions. The second task is integration, which refers to an individual's ability to combine these dimensions, using rules or schemata, to arrive at a behavioral response. Consistent with Goldstein and Blackman's (1978) definition of cognitive style, a person's ability to differentiate and integrate mediates between environmental input and behavioral response.

Under this theory, an individual who is low in differentiating and integrating ability is described as 'concrete'. On the other hand, the individual who is high in differentiating and integrating ability is described as 'abstract'. Where an individual is placed on this continuum from concrete to abstract determines his/her 'integrative' or 'conceptual' complexity. The characteristic processing styles of those who are closer to the concrete end of the continuum are described as being reliant on authority, intolerant of ambiguity, and rigid.

11.2.2.1 Measurement of Integrative Complexity

A majority of the tests used to measure integrative complexity are qualitative in the sense that they incorporate sentence or paragraph completion assessment techniques. For example, the Interpersonal Topical Inventory (ITI) presents subjects with a number of sentence and paragraph stems (e.g., "When I am in doubt…," "When I am criticized…") and asks them to complete the sentence or paragraph (Tuckman 1966). A similar test, the "This I Believe" Test (TIB) requires subjects to complete the phrase "This I believe about…" where topics such as friendship, guilt, people, and so on are inserted into the blank (Harvey 1963). Multidimensional scaling (MDS) techniques have also been used to assess integrative complexity by asking subjects to give similarity judgments between pairs of objects. The assumption is that the number of dimensions that result from an analysis of the similarity judgments correlates with the ability to differentiate whereas the obliqueness of the dimensions correlates with the ability to integrate (Goldstein and Blackman 1978).

11.2.3 Witkin's Field Dependence/Independence Theory

Witkin (1950) developed the idea of field dependence and field independence as a measure of cognitive style. Field dependence/independence (FD/I) refers to one's ability to separate an item from the field or environment in which it occurs. Individuals who are field independent are hypothesized to prefer problem-solving approaches that emphasize detail and basic relationships. On the other hand, field dependent individuals prefer approaches that are more global and intuitive (Henderson and Nutt 1980).

11.2.3.1 Rod-and-Frame Test

Early research testing Witkin's FD/I theory employed the Rod-and-Frame Test (RFT) (Witkin et al. 1954). This test places a subject in a dark room and asks them to view a lighted rod that is suspended within a lighted frame. Both the rod and frame are initially tilted and the subject is asked to direct the experimenter to adjust the rod so that it is completely vertical. Those who are able to do this successfully are field independent. Those who are not able to put the rod vertical (i.e., they are influenced by the tilted frame) are field dependent. In other words, they are not able to easily separate the target from its surrounding environment.

11.2.3.2 Group Embedded Figures Test

Witkin and colleagues (Witkin et al. 1971) developed the Embedded Figures Test (EFT), which asks a subject to recognize a geometric shape that is embedded within a complex background. As a result of an individual's ability to recognize the shape, he/she may be classified as either field independent or field dependent. Even with the development of the EFT, the RFT, and overall acceptance of the construct of FD/I, there is still disagreement regarding whether or not this construct truly represents a cognitive *style*, or if it is more of a cognitive *skill* (Paramo and Tinajero 1990).

11.2.4 Kolb's Learning Styles Theory

Kolb's (1984) learning cycle model is another approach to classifying types of cognitive processing into cognitive styles. This model proposes two bipolar dimensions of cognitive processing. The active-reflective dimension has to do with how individuals gather and grasp information. This can range from direct participation to detached observation. The second dimension, abstract-concrete, has to do with how individuals

transform information in order to use it. This can range from dealing with tangible objects to dealing with theoretical concepts.

Four types of learning styles have been developed using these two dimensions. The first, divergers, emphasize concrete experiences and reflective observation. These people are drawn towards recognizing problems and generating ideas. Assimilators, emphasizing abstract conceptualization and reflective observation, enjoy defining problems and formulating theories. The third type, convergers, fall between the abstract conceptualization and active experimentation space. These individuals value problem solving and the application of new ideas. Lastly, accommodators enjoy implementing plans and engaging in new experiences and favor concrete experiences and active experimentation. Kolb (1984) suggests that individuals show a preferred learning style. Although the terms 'learning style' and 'cognitive style' have been used interchangeably in the literature, Kolb (1984) conceptualizes learning style as just one manifestation of cognitive style that occurs within a learning environment.

11.2.4.1 Learning Style Inventory

Kolb (1976) developed the learning style inventory, which was designed to place individuals along the continuum between concrete experience and abstract conceptualization and active experimentation and reflective observation. This instrument asks subjects to complete open-ended statements (e.g., "I prefer…"; "I learn best through…"; "I tend to…") by choosing a response option (e.g., "I prefer hands-on learning experiences" versus "I prefer learning through thinking and responding"). Each individual is assigned a concrete experience (CE), abstract conceptualization (AC), active experimentation (AE), and reflective observation (RO) score based on their responses.

### 11.2.5 Gregorc's Learning Style Categories

Gregorc's four learning style categories are based on two dimensions: (1) an ordering dimension which ranges from sequential to random processing, and (2) a perceiving dimension which ranges from concrete to abstract data (Gregorc 1982). In this theory, abstract learners draw from a mental representation of their experiences in order to process information while concrete learners draw from an immediate reaction to new information. Butler (1984) described the four learning style categories as (1) concrete sequential, (2) abstract sequential, (3) abstract random, and (4) concrete random. The concrete sequential learner is known to be structured, practical, predictable and thorough. The abstract sequential learner is logical, analytical, conceptual, and studious. The abstract random learner is sensitive, sociable, imaginative, and expressive. Lastly, the concrete random learner is intuitive, original, investigative, and able to solve problems.

#### 11.2.5.1 Gregorc Style Delineator

The Gregorc Style Delineator is a self-report measurement inventory used to construct a paper-and-pencil graph delineating the four learning categories. Subjects are presented with a 'word matrix' of 40 words placed into groups of four (10 items each). They are asked to rank the words that are most descriptive of themselves on a scale of one to four where one denotes the least descriptive and four the most descriptive. Scores for each learning category range anywhere from 10 to 40 and are based on a sum of the rankings for all 10 items.

### 11.2.6 Kirton's Cognitive Styles

Kirton (1976) also developed an approach to identify differences in the way individuals prefer to process information. In this theory, the cognitive (or problem-

solving) styles are referred to as adaptors vs. innovators, which are placed on opposite ends of a continuum. With regard to problem definition, adaptors are more inclined to wait to be handed a problem, whereas innovators seek problems. With regard to problem solving, adaptors can be effective in modifying existing systems in conditions of relative stability, whereas innovators derive a challenge from seeking new and possibly unexpected solutions. With regard to the implementation of decisions, adaptors utilize precise, accurate, methodical, and disciplined approaches whereas innovators appear undisciplined with a low tolerance for routine work. With regard to image, adaptors are seen as safe, dependable, and conformists whereas innovators are seen as mavericks, having a lot of self-confidence, and constantly generating ideas. Again, Adaption-Innovation theory is meant to describe the 'how' or 'manner' of cognitive functioning or cognitive 'style' (Kirton 1989), which is different from level of processing.

#### 11.2.6.1 Adaption-Innovation Inventory

The Kirton Adaption-Innovation Inventory (KAI) (Kirton 1976) is used to place individuals along a continuum that ranges from 'adaptors' to 'innovators.' The inventory consists of 32 items where subjects are asked to indicate the degree of ease or difficulty (using five-point scales) with consistently maintaining specific adaptive and innovative behaviors over time. Responses to the items are used to calculate an overall score for each subject. The score can range from 32 to 160; respondents who score below the mid-point of this range (96) are termed 'adaptors'; 'innovators' score above this point.

## 11.3 Approaches to Studying Cognitive Style in Consumer Research

Although a number of scales intended to measure cognitive style in consumer research are situationally bound (e.g., Haddock, Zanna, and Esses 1994; Booth-

Butterfield and Booth-Butterfield 1996; Raman, Chattopadhyay, and Hoyer 1995), there are a few scales that have been developed to measure dispositional consumer processing styles that manifest across a variety of situations.

### 11.3.1 Need for Cognition

The Need for Cognition Scale (Cacioppo and Petty 1982; Cacioppo, Petty, and Kao 1984) is intended to measure cognitive processing across situations. It consists of 18 items and measures the extent to which individuals seek out and use cognitive information when making decisions. Subjects are asked to use a 5-point scale to rate how characteristic each of the items are of themselves, for example, "I would prefer complex to simple problems" and "I only think as hard as I have to."

### 11.3.2 Affective Processing Scale

Prompted by research using the Need for Cognition (NFC) scale as described above, Sojka and Giese (1997) intended to publish a situation-invariant affective processing scale that was analogous to the NFC. According to this scale, it is possible to identify four types of individuals from two types of processing styles (affective and cognitive). The results of Sojka and Giese's (1997) study suggest that affective and cognitive processing systems are independent yet can operate interactively, which results in some individuals being classified as 'combination processors'. Items used to comprise the scale include, for example, "I make decisions with my heart" and "When I recall a situation, I usually recall the emotional aspects of the situation." Respondents are instructed to indicate the degree of agreement or disagreement with each of the 13 scale items.

### 11.3.3 Rational-Experiential Inventory

The Rational-Experiential Inventory (REI) is a measure of dispositional thinking style that has its theoretical foundation in cognitive-experiential self theory (CEST) (Epstein et al. 1996). The original REI scale consists partly of items from the Need for Cognition Scale (19 items) as well as 12 Faith in Intuition items (Epstein et al. 1996; Pacini and Epstein 1999). Methodological improvements to the scale have resulted in scales for Experientiality and Rationality to distinguish between rational and experiential thinking styles. REI scale items include, for example, “I think there are times when one should rely on one’s intuition” and “I am much better at figuring things out logically than most people.”

# CHAPTER 12

# DECISION STYLE THEORY

Cognitive styles are viewed as relatively stable dispositions which lead to differences in behavior in the decision-making process (Leonard, Scholl, and Kowalski 1999). Cognitive style theory proposes that an individual's cognitive style relates to individually preferred cognitive strategies involved in organizing and processing information and therefore also strategies of decision making. Decision style may be used to identify different types of decision makers. Identifying these differences helps us to determine how the individual thinks about various situations, processes information, and makes decisions. Rowe and Boulgarides (1992) also argue that once we know the decision style, we may able to predict outcomes in terms of decision behavior.

## 12.1 Definition of Decision Style

As adopted in the consumer behavior literature, decision style is defined as a preferred mode or mental orientation that is used to conceptualize a decision making situation and negotiate the decision making process to arrive at an acceptable choice (Sproles and Kendall 1986). According to Rowe and Mason (1987), decision style encompasses the mental activities of perception, information processing or cognition, making a judgment, and coming to closure of the problem. Rowe and Boulgarides (1992) define decision style as the way one visualizes and thinks about situations. In general, then, decision style is defined as how people think about and make decisions in various situations (Zmud 1979).

## 12.2 Approaches to Studying Decision Style

Instead of discussing models of decision styles or coping mechanisms that are situationally variant (e.g., Arroba 1977; Janis and Mann 1977), this section will focus on those that represent a manifestation of cognitive style, that is, decision styles that individuals tend to consistently demonstrate across situations.

### 12.2.1 Huysman's Reasoning Style

Huysman (1970) proposed that decision makers engage in a preferred style of reasoning that is either analytic or heuristic. An analytic decision maker takes problems and transforms them into a set of underlying relationships, which are used to develop alternative courses of action. On the other hand, a heuristic decision maker uses solutions to similar problems that have solved in the past to come up with action alternatives. Heuristic decision makers are more likely to employ common sense and intuition when solving problems that they face.

### 12.2.2 McKenney and Keen's Decision Styles

McKenney and Keen's (1974) decision style model incorporates two dimensions: information gathering and information evaluation. The information gathering dimension ranges from perceptive to receptive styles of information acquisition. Perceptive gatherers use concepts such as relationships to search for information while receptive gatherers are more likely to use details. The information evaluation dimension ranges from intuitive to systematic styles of decision making. By combining these dimensions, McKenney and Keen (1974) described four so-called decision styles, which they labeled ''systematic-perceptive,' 'systematic-receptive,' 'intuitive-perceptive,' and 'intuitive-receptive.'

### 12.2.3 Mason and Mitroff's Decision Styles

Mason and Mitroff (1973) developed a decision style model that is founded upon Jung's (1923) cognitive style typology as described above. Recall that the MBTI, used to operationalize Jung's typology, categorizes individuals along four dimensions of cognitive style: (1) sensing-intuition, (2) thinking-feeling, (3) judging-perceiving, and (4) introversion-extroversion. Mason and Mitroff (1973) focused their decision model on two decision-oriented tasks: information acquisition and data processing. For information acquisition, individuals are classified using Jung's sensing-intuition dimension. Individuals who are sensing prefer structured information and focus on details whereas intuitive individuals prefer relying on hunches. For data processing, individuals are classified using Jung's thinking-feeling dimension. Thus, individuals who are thinkers prefer analytical and logical modes of evaluation. On the other hand, individuals who are feelers use emotions and values to guide their evaluations. By combining these two dimensions, Mason and Mitroff (1973) described four categories of decision style: (1) sensation-intuition, (2) sensation-feeling, (3) intuition-thinking, and (4) intuition-feeling. This framework has been used most often to study the decision-making styles of managers (e.g., Henderson and Nutt 1980; Mitroff and Kilmann 1975).

### 12.2.4 Driver and Colleagues' Decision Styles

Over twenty years of research on managerial decision making resulted in the development of the Driver Dynamic Decision Style model (e.g., Driver, Brousseau, and Hunsaker 1993; Driver and Mock 1975; Driver and Streufert 1969). This framework proposes that various decision styles may be identified using two factors. First, individuals differ in the amount of information they use or consider when making a

decision or solving a problem. The second factor involves the number of solutions or alternative courses of action that are considered, that is, the level of 'focus' employed during decision making. The first factor, information use, ranges from a maximizing mode where all information available to solving a problem is considered to a satisficing mode where new information is only considered until the point where a reasonable decision can be made. The level of focus ranges from uni-focus, where decision makers narrow in on one specific solution, to multi-focus, where decision makers generate and consider a variety of options for dealing with their situation.

The combination of the two dimensions described above results in five basic managerial decision styles (Driver, Brousseau, and Hunsaker 1993). First, the decisive style is a combination of satisficing information use and uni-focus style. These individuals make decisions quickly and efficiently. The flexible style is a combination of satisficing information use and multi-focus style. These individuals are adaptable and intuitive in their decision style. The hierarchic style is a combination of maximizing information use and uni-focus style. These individuals make decisions in a methodical and logical manner. Their focus is on quality over quantity. The integrative style is a combination of maximizing information use and multi-focus style. These individuals, unlike hierarchics, focus on quantity over quality. They are much more creative and exploratory in their decision style. A fifth category of decision style is termed systemic. This is a mixture of both the hierarchic and integrative styles. Systemic decision makers use large amounts of information when first approaching a problem, but then prioritize alternative courses of action and come up with a solution in a style that is more hierarchical.

This framework of decision style has primarily been used with managers and team members to promote an understanding of and capitalization on different decision styles. The assumption is that successful organizations, departments and teams make the best use of the strengths of individuals that employ each of the above decision styles.

### 12.2.5 Rowe and Colleagues' Decision Styles

Rowe & Mason's (1987; see also Rowe and Boulgarides 1992) Decision Style Model is actually based on earlier work with Driver (Driver and Rowe 1979) on the use of information and level of focus in decision making. This framework is again based on two dimensions that are termed cognitive complexity and environmental/contextual/value orientation. Cognitive complexity refers to a person's tolerance for ambiguity versus preference for structure. Value orientation refers to a person's consideration of human/social versus task/technical concerns in decision making. The combination of these two dimensions results in four decision styles: Directive, Analytical, Conceptual, and Behavioral.

Directive decision makers are described as having a low tolerance for ambiguity and are oriented towards task and technical concerns. These individuals are systematic and rule-based in their decision processing. Analytical decision makers have a high tolerance for ambiguity and are oriented towards task and technical concerns. These individuals are logical and analytical in their decision processing. Conceptual decision makers are described as having a high tolerance for ambiguity and are oriented towards people and social concerns. These individuals are creative and risky in their decision processing. Behavioral decision makers have a low tolerance for ambiguity and are

oriented towards people and social concerns. These individuals are instinctual, empathic and interactive in their decision processing.

12.2.5.1 Decision Style Inventory

Based on the above framework, the Decision Style Inventory (DSI) was developed to measure the decision style of managers. The DSI is composed of twenty questions regarding decision-making preferences. Each question has four response options corresponding to each of the decision styles. Individuals are asked to rate each of the four options (behavioral responses) in terms of the likelihood of its use. These questions have to do with typical situations that managers face. Individual scores for each decision-making style are computed by summing the scores for the options corresponding to that style (8=most preferred option; 4=option considered often, 2=option considered on occasion, 1=least preferred option). Thus, the raw scores for each dimension, Directive (DIR), Analytical (ANA), Conceptual (CON), and Behavioral (BEH), range from 20 to 160. Using these scores, the intensity of each style is labeled as very dominant, dominant, back-up or least-preferred (Rowe & Mason 1987). However, while the instrument is a forced choice instrument, individuals can employ more than one dominant style.

# CHAPTER 13

# CONSUMER DECISION STYLE THEORY

Based on the cognitive and decision styles research published in psychology and management, the conceptualization of consumer decision styles has received some attention recently in the marketing literature (e.g., Bao, Zhou, and Su 2003; Lysonski, Durvasula, and Zotos 1996; Wickliffe 2004). Sproles and Kendall (1986, p. 267) defined a consumer decision style as "a mental orientation characterizing a consumer's approach to making choices." Consumer decision styles are described as a part of a consumer's "personality" (Sproles and Kendall 1986; p. 268). In the past, research on consumer decision styles has been used to understand shopping behaviors and to develop counseling and marketing tools. For example, advertisers and marketers may want to target different marketing programs to different consumer groups, based on their common decision style.

## 13.1 Approaches to Studying Consumer Decision Style

Lynsonski, Durvasula, and Zotos (1996) categorize research on consumer decision style into three areas: (1) the consumer typology approach (e.g., Darden and Ashton 1974; Moschis 1976); (2) the psychographics/lifestyle approach (e.g., Lastovicka 1982); and (3) the consumer characteristics approach (e.g., Sproles and Kendall 1986; Sproles and Sproles 1990). The common idea present throughout all of these approaches is that consumers tend to behave in a manner consistent with certain fundamental decision-making modes or styles including, among others, concerns regarding brands, prices, and quality.

The consumer characteristics approach seems to be the most utilized and powerful approach since it focuses on "the mental orientation of consumers in making decisions" (Lynsonski, Durvasula, and Zotos 1996, p. 11). It also seems to be the most consistent with the definitions of cognitive style and decision style as defined earlier since it deals with "cognitive and affective orientations of consumers in their process of decision" (Lynsonski, Durvasula, and Zotos 1996, p. 11). However, as described below, much of the research that stems from this approach is concerned with identifying general consumer orientations toward simple, everyday types of shopping and buying decisions.

### 13.1.1 Sproles and Kendall's Consumer Styles Inventory (CSI)

Sproles & Kendall (1986) developed the Consumer Styles Inventory (CSI), which is a measurement tool that uses eight decision-making dimensions to explain why shoppers behave in certain ways. One of the most important assumptions underlying this instrument is that each consumer's specific decision-making style results from a combination of their scores on each of the decision-making dimensions. The CSI contains 40 Likert-scaled items with response options that range from 1 (strongly disagree) to 5 (strongly agree) (Sproles and Kendall 1986). Examples of items in the inventory include "Shopping is a pleasant activity to me," "I have favorite brands I buy over and over," "The lower price products are usually my choice," and "I keep my wardrobe up-to-date with the changing fashions."

The eight dimensions of consumer style are described by Sproles and Kendall (1986) as (1) perfectionism or high quality consciousness, (2) brand or 'price equals quality' consciousness, (3) novelty or fashion consciousness, (4) recreational and hedonistic shopping consciousness, (5) price or 'value for money' consciousness, (6)

impulsiveness, (7) confusion by over-choice, and (8) habitual or brand loyal orientation. Note that Sproles and Kendall (1986; see also Wesley, LeHew, and Woodside 2006) speculated that a consumer may use more than one decision-making style across a variety of consumption situations; they thought that consumers tend to primarily use two or three styles when making choices.

#### 13.1.1.1 Shim's Short Form of the CSI

Shim (1996) developed a short form of the CSI by choosing 32 statements from the original inventory that had the highest loadings for each of the eight consumer decision-making styles (4 per each style). The results of this study using the 4-item subscales showed slightly greater reliability of the inventory than Sproles and Kendall's (1986) original assessment.

## 13.2 Summary of the Literature on Cognitive and Decision Styles

To summarize, cognitive style is a hypothetical construct that has been developed to explain the process of mediation between stimuli and responses. The term *cognitive style* refers to the characteristic ways in which individuals conceptually organize the environment (Goldstein and Blackman 1978). Individuals have been shown to vary in the consistent cognitive patterns they use to organize and process information; these patterns organize behavior as well as internal and environmental cognitive inputs (Guilford 1980; Messick 1976; Messick 1984; Zajonc 1968). An individual's cognitive style relates to an individual's preferred cognitive strategies involved in change and therefore also strategies of decision making, which is itself an overlapping concept or facet of the same concept. Decision style, then, is a preferred mode or mental model that is used to conceptualize a decision situation and negotiate the decision-making process to arrive at an acceptable

choice. Consumer decision styles is defined by Sproles and Kendall (1986, p. 268) as "a mental orientation characterizing a consumer's approach to choices."

An established scale developed by Sproles and Kendall (1986) used to characterize consumer decision-making styles in the United States is named the Consumer Styles Inventory (CSI). This scale was intended to measure general orientations towards shopping and buying in everyday consumption and identified characteristics of consumer decision making that included high-quality consciousness, brand consciousness, novelty-fashion consciousness, hedonistic shopping consciousness, price shopping consciousness, impulsiveness, confusion, and habitual or brand loyal orientation towards consumption.

# CHAPTER 14

# CONSUMER DECISION STYLES IN HIGH-STAKES CHOICE SITUATIONS

One motivation for developing a new consumer decision style scale is that the types of considerations made in simple, everyday consumption scenarios, as assessed by the Consumer Styles Inventory (Sproles and Kendall 1986), are not typically important, or even relevant, to more complex consumer decision situations such as those involving financial investments or healthcare treatment choices. In high-stakes decision situations, appraisals that one's most important lifetime goals (e.g., safety, well-being) are being threatened will signal decision complexity (Lazarus 1991).

As we know from research on adaptive decision making, it is typical for decision makers to use different decision making strategies in different situations (Payne, Bettman, and Johnson1993; Tversky and Kahneman 1986). In other words, decision makers will adapt to different decision environments based on their goals and effort-accuracy trade-offs. When faced with a high-stakes decision, consumers often make choices in a 'rational' or 'systematic' manner (e.g., planful problem solving; Luce, Bettman and Payne 1997) with the complexity and importance of the situation serving as an incentive to process in a more effortful manner. However, as we know from the research on constructive choice processes, consumers may also significantly deviate from behaviors predicted by normative decision models (Kunreuther et al. 2002). In high-stakes decision situations, the complexity may act as a deterrent to processing systematically and lead one to rely on the use of simpler decision making strategies and heuristics such as avoiding trade-offs (Kahn and Baron 1995). There is also some work

that shows that stressful or emotional decisions may make a decision process both more effortful (process more extensively) and more limited (process using attribute-based criteria and avoiding trade-offs) at the same time (Luce, Bettman and Payne 1997; Luce, Payne and Bettman 1999).

Individual differences in the way that a consumer approaches and negotiates a high-stakes decision process can be illustrated by the following quotes (Wong and King 2008):

> "But, when they tell you you have cancer, and you know… they can't tell you you are going to live through this for sure. They can't tell you that. And they can't tell you when, whether or not it is going to come back, or when… They can give you statistics. Lots and lots of statistics… There are people who read, go to the medical schools and read up on things and all that. That's not my style, you know. If I had more time, I wouldn't have done that anyway, probably."

> "They are going to tell me the same thing… cause it is just a statistic, you know. You can read the reports. And he gave me all the literature to read and stuff. Which, I browsed through some of it, but I mean I'm not one of those that's gonna… I don't need to know the details of it, down to the low level. I don't need to be a doctor about it. I need to trust my doctor, and I did. I trusted him."

> "And I talked to several people before I went the surgery route. I talked to a few people in my synagogue that I knew had had mastectomies, and who they used and what they ended up doing and all that. And I even talked to my gynecologist nurse who had had a mastectomy also. So, I had input from several sources, to get a good idea of what to expect and what to look for and what they recommended, so I wasn't doing this totally blind. So I found that very helpful too. Did a little bit of reading, a little bit of research…that kind of thing."

> "And then, I went and researched every doctor and went for second opinions, third opinions, fourth opinions. I think I saw four or five doctors before I decided I'm finally going to do it because I wanted to make sure that even though I knew in the back of my mind that I was making the right decision, I needed to get other people to tell me that I was making the right decision, and they all said the same thing, you know, you can have the radiation or have the mastectomy."

The unique nature of complex decision-making is starting to be recognized (e.g., Kunreuther et al. 2002; White 2005; Eoyang, Yellowthunder and Ward 1998). The goal

of this essay is to further our understanding of how consumers may differ in the ways they think about and approach choices in risky and important decision situations. Because high-stakes decisions are characterized by high levels of uncertainty and complexity and are often embedded within complex systems, the tenets of complexity science theory are used to develop a scale that measures consumer decision style in high-stakes decision situations. Specifically, some individuals have a greater tendency to adopt a complex approach to high-stakes decision making. Similar to work in the area of leadership behaviors in healthcare organizations (Anderson and McDaniel 2000; Writers for the Center for the Study of Healthcare Management; Zimmerman, Lindberg, and Plsek 1998), the science of complexity is used to provide insight into high-stakes decision-making as it is experienced by individual decision makers.

### 14.1 Metaphors for Studying Complex Systems

A traditional scientific view of systems and how they operate is based on rational, linear-based models. These models parcel the world into 'machine-like' systems that receive inputs, transform them, and produce outputs (Capra 1996). This approach posits that we can understand any type of system and predict its actions by developing simple, linear cause-and-effect rules. This mechanistic metaphor of systems has influenced much of the past research in physics, biology, economics, medicine and organizations. In healthcare specifically, this framework guided the orientation of medicine around organ-based disciplines and our mostly linear view of disease and treatment.

For centuries, this Newtonian model of systems has shaped the way people believe that systems behave and therefore have constrained the possible ways that people think about systems (Begun, Zimmerman and Dooley 2003). Gareth Morgan argues that

all science is a metaphor and whatever metaphor we subscribe to is what shapes our perspectives on life and the way the world, and the systems contained in it, work (Zimmerman, Lindberg and Plsek 1998). Metaphors influence the questions we ask and hence the answers we find. A powerful metaphor becomes deeply rooted in our ways of understanding and is often implicit rather than explicit. In biological terms, a metaphor is the schema by which we make sense of our situation (Zimmerman, Lindberg and Plsek 1998).

In contrast to a more traditional way of thinking about complex systems, complexity science adopts the dominant metaphor of a system as a living organism, rather than the system as a machine. This metaphor creates a new holistic worldview by reframing our understanding of the systems we are studying or living within. At an abstract level, viewing the world through the lens of complexity science entails seeing systems as integrated wholes rather than dissociated collections of parts (Capra 1996). This view values connectedness and relationships among parts of a system and the context of the system when trying to understand and predict system behavior. It means putting something into the context of a larger whole in order to understand problems or make decisions (Capra 1996).

### 14.2 Complexity Science Theory

Complexity science, or the study of complex systems, is defined as the understanding of emergent behavior exhibited by interacting systems operating at the threshold of stability and chaos (Lucas 2007). Complexity science focuses on how order can emerge from a complex dynamic system with a large number of interacting components (Nicolis and Prigogine 1989). It challenges the reductionist focus science has

had with the law of parsimony and other similarly limiting notions as described above (Bütz 1997). Some researchers have proposed that we use the tenets of complexity science to guide our understanding of complex systems and the behavior of agents within these systems (Zimmerman 1999). In fact, social phenomena, including organizations, have been the subject of investigations using methods and metaphors from complexity science since the early 1990s (Begun, Zimmerman, and Dooley 2003; Eve, Horsfall, and Lee 1997; Goldstein 1994; Kiel 1997; Stacey 1996; Wheatley 1992).

Complexity science is based on the notion that systems or organizations, such as those involved in healthcare, can be categorized as complex adaptive systems (CASs) (Anderson and McDaniel 2000). 'Complex' implies diversity – a wide variety of elements. These elements interact with each other in a great many ways (Waldrop 1992). 'Adaptive' suggests the capacity to alter or change – the ability to produce new information by learning from experience. This goes for individuals to species to corporations and industries. A 'system' is a set of connected or interdependent things. In a CAS, the 'things' are independent agents that act as information processors (Casti 1997; Cilliers 1998; Waldrop 1992; Zimmerman, Lindberg, and Plsek 1998). Embedded within a CAS, agents have the capacity to exchange information among themselves and with their environment and to adjust their own behavior as a function of the information they process.

### 14.3 Consumers as Agents within Complex Systems

Consumers are often faced with making high-stakes decisions within dynamic, risky, and complex contexts. These decisions are embedded within complex systems as defined above (Zimmerman, Lindberg, and Plsek 1998). In fact, the major antecedent

required for complex systems is a large number of agents with the potential to interact (e.g., staff of a hospital, members of a cultural or familial group, etc.) (Holden 2005). Agents within a complex system are diverse from each other and each possesses information that may be useful for another agent in the system (Kauffman 1995). Each agent will have a different understanding of the system and will rely on different sources of information in cognitive processing (Casti 1997).

### 14.3.1 Complex Decision Style

Similar to previous work in the context of leadership styles and managerial decision making (e.g., Allison and Hayes 1996; Sadler-Smith 2004), here complexity science is used as a theoretical framework to conceptualize the ways that individual consumers (or agents) faced with a high-stakes decision will think about and negotiate the decision process to arrive at a preferred choice. In other words, consumers will vary in the extent that they adopt a complex approach to high-stakes decision making. First, consumers may differ in the mental models that they use to think about and conceptualize a decision situation (Anderson and McDaniel 2000). Some consumers may have a greater tendency to apply the metaphors from complexity science, for example, viewing the decision situation as an integrated whole, comprised of many connected and interacting parts which are continually emergent, dynamic, and unpredictable. In the context of consumer decisions, individuals may recognize the decision situation as embedded within networks of relationships and a variety of information sources, each operating from and possessing its own information. These information sources may profoundly affect choices (e.g., familial, media, or cultural influences) (Wilson, Holt, and Greenhalgh 2001).

In addition, consumers may differ in the ways that they negotiate the decision making process to arrive at a preferred choice. Some consumers (i.e., agents) may have a greater tendency to apply the complexity principles of diversity and collaboration. For example, in the context of leadership behaviors, this means that they would be more likely to collaborate around tasks and support shifting leadership roles as processes unfold. Similarly, complex decision makers have a greater tendency to work with, rather than against, complexity by negotiating the decision process in a collaborative and integrative manner, for example, by collecting information from a wide variety of agents in the system and gaining an overall 'big picture' view of his or her situation.

In summary, a complex approach to decision making is characterized as being collaborative and integrative, the decision maker tends to feel connected with other agents in the system and recognize the inherent unpredictability of the situation. When faced with a high-stakes decision situation, individuals will vary to the extent that their decision styles are complex.

# CHAPTER 15

# DEVELOPMENT OF THE COMPLEX DECISION STYLE (CDS) SCALE

Currently, perceptual scales for measuring constructs that are central to complexity science do not exist, and if measured at all, they are observed via secondary sources (Begun, Zimmerman, and Dooley 2003). The CDS scale is developed to measure the degree to which a complex decision style is employed by a consumer in high-stakes decision situations. Based on a literature review and the results of study one, decision style is defined as a mental orientation characterizing the way a consumer tends to think about a decision situation and negotiate the decision process to arrive at a preferred choice. Also based on previous literature and study one results, a decision is considered to involve high stakes if it has subjectively important, risky, and life-altering outcomes (Kahn and Baron 1995; Kunreuther et al. 2002; White 2005). Thus, a complex decision style (CDS) is defined as a mental orientation towards high-stakes decisions characterized by (1) conceptualizing the situation as inherently complex and comprised of many connected parts and (2) negotiating the decision process in a collaborative and integrative manner.

In psychology, the argument of 'state versus trait' (Spielberger 1972) posits that (1) states are a person's personality characteristics that are flexibly defined as a function of the particular situation that they are in at the moment, whereas (2) traits are a person's personality characteristics that are enduring and define the parameters of an individual's behavior. This scale is intended to measure a trait since it assesses the tendency of an individual to consistently employ a complex decision style across all types of high-stakes

decision situations. This conceptualization is consistent with the cognitive style literature as discussed previously.

To develop the CDS scale, the scale development paradigm as proposed by Churchill (1979) and DeVellis (2003) was followed. This process consists of four separate studies. Study one generates an initial pool of items to measure CDS through a detailed literature review and an exploratory questionnaire given to a sample of university students. After assessing the content validity of the initial pool of items, study two purifies the scale items and assesses the reliability as well as convergent and discriminant validity of the purified scale. Study three is conducted to assess the generalizability of the scale across high-stakes decision situations and provide an initial assessment of the predictive validity of the CDS scale. A fifth study is conducted to again assess the predictive validity of the scale with a normal population sample as well as test differential hypotheses based on CDS within a conceptual a model of choice of elective healthcare treatment.

### 15.1 Study One: Literature Review and Item Generation

The objective of study one is to refine definitions of important constructs of interest and generate a pool of possible items for inclusion in the CDS scale. The first goal is to develop a definition for complex decision style. This study consisted of reviewing the relevant literature on decision styles and complexity science as discussed previously and asking a series of open-ended questions to a sample of undergraduate students (n = 58). Please refer to Appendix A for a sample of this questionnaire.

In the first section of the questionnaire, the respondents were provided with a conceptual definition of consumer decision style (Sproles and Kendall 1986) and were

asked to describe what they would consider a consumer decision style and give their own definition of consumer decision style. Based on their responses, the definition of consumer decision style adopted in this essay was further defined. Sproles and Kendall (1986) define consumer decision style as a preferred mode or mental orientation that is used to conceptualize a decision making situation and negotiate the decision making process to arrive at an acceptable choice. Based on the results of study one, this definition was revised to include how a consumer 'thinks about' the decision situation. Thus, consumer decision style is defined as a mental orientation characterizing the way a consumer tends to think about or conceptualizes a decision situation and negotiates the decision process to arrive at a preferred choice. Also in the first section of the questionnaire, respondents were asked whether they felt that individual consumers differed in terms of their decision styles. All of the respondents (100%) indicated that they felt that consumers differ in terms of their decision styles.

In the second section of the questionnaire, two examples of what was meant by the phrase 'complex decision making' were provided to the respondents (e.g., deciding which stocks to buy and sell; choosing a healthcare treatment) and they were asked to give a definition of and describe how they would characterize a complex decision situation. Based on a qualitative analysis of their responses, it was determined that the responses were more consistent with the concept of 'high-stakes' rather than 'complex' decision making as has been distinguished in the marketing literature. According to Bettman, Johnson, and Payne (1991), the complexity of a decision task increases along with increases in (1) the number of alternatives or attributes, (2) the difficulty of processing of related information, (3) the uncertainty about the value of some of the

attributes, and (4) the comparability of some of the attributes in the set. High-stakes decisions are defined as ones with subjectively important and risky outcomes (White 2005). Thus, although high-stakes decision situations may encompass some of the same characteristics of complex decision situations, these decisions are more emotionally difficult and stressful for the majority of people and the consequences of these decisions have a larger impact on one's life (Kahn and Luce 2003). These types of decisions often involve choices regarding healthcare, housing, insurance, or security and involve a substantial amount of thought from consumers as well as a large portion of consumer spending (Kahn and Luce 2003). Based on the results of study one, this definition was revised to include the characteristic of being 'life-altering'. Thus, a high-stakes decision is defined as a decision that has subjectively important, risky, and life-altering outcomes.

In the third section of the questionnaire, respondents were asked how they would (1) conceptualize a complex decision situation and (2) the process that they would use to arrive at a choice in these types of situations. The questions asked were similar to the item generation process as described in Richins and Dawson (1992) and Peck and Childers (2003). Based on these responses and the literature review, an initial pool of 96 items were written for possible inclusion in the CDS scale. This initial pool included 21 items to tap into the way that a consumer thinks about or conceptualizes a high-stakes decision situation and 75 items to assess how the consumer negotiates the decision process to arrive at a preferred choice.

### 15.1.1 Assessing the Content Validity of the Initial Items

The next step was to assess the content validity of these initial items. This was accomplished by asking a group of four marketing PhD students and one marketing

professor to evaluate the items for grammatical errors, wording ambiguity, item similarity, possibility for ordering effects, and face validity. The participants were also provided with definitions of the constructs of interest. Based on their comments, some of the items were rewritten to provide more clarity as to the meaning of the item (13 items), to correct for grammatical errors (2 items), and to correct for the item being too similar to another item (1 item). In addition, one item was removed because the meaning was too ambiguous and not able to be clarified through re-wording. This left 95 possible scale items to be considered in the item purification study. Among the items, 40 were worded in a way that they would be reverse-coded (i.e., tapped into a more 'traditional' versus 'complex' decision style). The items were meant to capture variance in either the conceptualization (21 items) or negotiation (74 items) of the decision situation.

### 15.2 Study Two: Item Purification and Scale Structure

The purpose of this study was to purify the scale following the procedures advocated by Churchill (1979), DeVellis (2003) and Spector (1992). The 95 item CDS scale was administered to a sample of 198 undergraduate students to provide preliminary estimates of reliability and scale structure. Before answering the scale items the respondents were provided a brief description of high-stakes consumer decision making. They were then asked to recall and describe "a time when you had to make a high-stakes consumer decision". The Rational-Experiential Inventory (REI) (Pacini and Epstein 1999) (40 items loading on 2 factors) was also administered for the purpose of testing for discriminant validity. Please refer to Appendix B for a sample of this questionnaire.

95 males (48%) and 103 females (52%) participated in the study for partial course credit. The average respondent was 21.2 years of age with a minimum of 19 and a

maximum of 33. A seven-point Likert response scale corresponded to each of the scale items. Five responses were deleted either because of obvious inconsistent patterns in the responses or a large portion of missing data. This left 193 usable questionnaires for the following analysis.

Before item purification, the group of 21 conceptualization items had a coefficient α of 0.586 while the 74 negotiation items had a coefficient α of 0.592. The complete 95 item scale had a coefficient α of 0.669. Individual scale items were then assessed by examining means, variances, squared multiple correlations (SMCs), item-to-total correlations and results of an exploratory factor analysis (EFA) using principle axis factoring with oblimin rotation. This led to the purification of 84 items to arrive at the final scale to be used in study three.

DeVellis (2003) suggests that one should examine the mean and variance of each item to check that the means are close to the center of the range of possible responses (e.g., 4 on a 7 point scale) and that the variances are relatively high. Extreme mean values are not desirable because the item may not be worded strongly enough or may not be detecting certain values of the construct. Low variances are not desirable because the item may not be differentiating among individuals that possess various levels of the construct being measured. Based on these criteria, 11 items with extreme means or low variances were deleted from the scale (1 from the group of conceptualization items and 10 from the group of negotiation items).

The next step in the item purification process involved examining the correlations between items to make sure they met the requirements necessary to apply factor analysis (Hair et al. 1998; Bearden, Hardesty, and Rose 2001). The Bartlett test of sphericity was

used to obtain the probability that the correlation matrix includes significant correlations among at least some of the variables. The null hypothesis is that the intercorrelation matrix comes from a population in which the variables are noncollinear (i.e., an identity matrix). This test revealed that the data were appropriate for factor analysis ($\chi^2 = 8113.98$, df = 3486, $p < 0.001$). Thus, the sample intercorrelation matrix did not come from a population in which the intercorrelation matrix is an identity matrix. The Kaiser-Meyer-Olkin test of sampling adequacy was used to assess each item with regards to its probability of perfect prediction by the other variables. Hair et al. (1998) argue that a value below .50 (0 to 1 range) is unacceptable. This test resulted in a KMO of .664.

Squared multiple correlations (SMCs) and item-to-total correlations were examined to determine the common variance that each of the items shared with the other items (DeVellis 2003; Richins and Dawson 1992). Items with low SMCs and corrected item-to-total correlations were removed. This resulted in the removal of 52 items from the scale (following guidelines of removal if the SMC was less than 0.30 and the corrected item-to-total correlation was less than 0.50). As a result, 32 items were retained in the scale (8 to tap into conceptualization and 24 to tap into negotiation).

### 15.2.1 Dimensionality and Reliability

The next step is to examine the dimensionality of the scale items. An exploratory factor analysis (principal axis with oblimin rotation) was used (DeVellis 2003; Spector 1992) and led to the additional purification of 21 items. The EFA yielded a 4 factor solution that accounted for 70.65% of the variance. The factors had an average loading of .790 for CDS1, .663 for CDS2, .703 for CDS3, and .828 for CDS4. Two items were chosen to capture variability in the 'Connected' dimension (CDS1), which represents the

extent to which a person conceptualizes the situation as one that connects them to others. Three items represent the 'Complexity-focused' dimension (CDS2), which concerns the extent to which a person conceptualizes the decision situation as inherently complex and unpredictable. Four items describe the 'Responsive' dimension (CDS3), which represents the extent to which a person is collaborative in his or her decision process. Two items tap into the 'Integrative' dimension (CDS4), which captures the extent to which a person is open to a variety of information. These items exhibited the most desirable psychometric properties (e.g., high loadings on only one factor; Hair et al. 1998). Consequently, these 11 items are included in the CDS scale in the confirmatory factor analysis. The total coefficient alpha was .688. The coefficient alpha for CDS1 was .767, .697 for CDS2, .802 for CDS3, and .816 for CDS4. These values are greater than or very close to the .70 cutoff as proposed by Nunally and Bernstein (1994). Hair et al. (1998) state that the lower limit for exploratory research may be decreased to .60. In addition, all of the scales have four or less items which warrants less stringent criteria.

To further purify the scale items and evaluate their structure, a theoretical model specifying four latent factors underlying CDS was tested by performing confirmatory factor analysis (CFA) on the correlation matrix using LISREL 8.5 (Jöreskog and Sörbom 1996). SMCs, standardized residuals and modification indices generated from the CFA were examined and warranted no more deletions of scale items. Please refer to Table 4 for scale properties based on the CFA and to Table 5 for the items included on the CDS scale. Overall, the four factors explained 56.58% of the total variance. Measurement indices for the model demonstrated acceptable fit: ($\chi^2 = 49.96_{(38df)}$, p = 0.093; RMSEA = .040; CFI = 0.984, n = 193). An RMSEA of .040 represents reasonable errors of

approximation in the population and indicates good fit (Byrne 1998). The CFI exceeded the .90 cutoff recommendation (Bentler 1992).

**Table 4**
Psychometric Properties of the CDS Scale

| Item | Coefficient Alpha (α) | Composite Reliability (CR) | Standardized Loadings (SL) |
|---|---|---|---|
| **Responsiveness:** | | | |
| …collaborating with others | .767 | .775 | .86 (*) |
| …arriving at a consensus with others | | | .80 (t=11.18) |
| …listening to the opinions of others | | | .58 (t=8.00) |
| …co-participating with others in the decision process | | | .62 (t=8.61) |
| **Complexity-focused:** | | | |
| …a situation that is relatively unpredictable | .697 | .738 | .51 (*) |
| …a situation having relatively unknowable outcomes | | | .70 (t=5.53) |
| …a situation that gets increasingly more complicated as time passes | | | .77 (t=5.34) |
| **Diversity-focused:** | | | |
| …focusing on differences among others' opinions | .802 | .781 | .84 (*) |
| …focusing on the variation among others' opinions | | | .82(t=6.48) |
| **Connectedness:** | | | |
| …a situation in which I feel connected to others | .816 | .816 | .84 (*) |
| …an experience that connects me to others | | | .75(t=3.87) |

Notes: *the coefficient for the indicator was fixed to 1 to calculate significance of other paths.

**Table 5**

Items Included in the CDS Scale based on Study Two Results

Please indicate the extent to which you agree or disagree with the following statements regarding high-stakes decision making.

**I think about or conceptualize a high-stakes decision situation as…**

| | **strongly disagree** | | | | | | **strongly agree** |
|---|---|---|---|---|---|---|---|
| 1. A situation that is relatively unpredictable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. A situation in which I feel connected to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. A situation that gets increasingly more complicated as time passes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. A situation having relatively unknowable outcomes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. An experience that connects me to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**I negotiate the decision making process to arrive at a preferred choice by…**

| | **strongly disagree** | | | | | | **strongly agree** |
|---|---|---|---|---|---|---|---|
| 6. Collaborating with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Focusing on differences among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Listening to the opinions of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Focusing on the variation among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Co-participating with others in the decision process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Arriving at a consensus with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Composite reliability was also calculated and met the .70 threshold for each factor (Bagozzi and Yi 1988; Fornell and Larcker 1981; Hair et al. 1998). Specifically, the composite reliability was .775 for CDS1, .738 for CDS2, .7812 for CDS3, .816 for CDS4. Composite reliability is a measure of the internal consistency of the construct indicators, depicting the degree to which they indicate the common latent (unobserved) construct (Hair et al. 1998). To measure the amount of variance that is captured by the construct compared to variance due to measurement error, AVEs for each factor were calculated. The AVE for CDS1 was .634, .498 CDS2, .525 for CDS3, and .690 for CDS4. These all came close to or exceeded the .50 cutoff (Fornell and Larcker 1981). All of the factor loadings were significant based on a .05 significance level (Hair et al. 1998). As a test of discriminant validity between the factors, the squared correlation between the dimensions were all less than the AVEs and the confidence intervals around the phi values ($\varphi \pm 2$ standard deviations) did not contain 1.0 (Fornell and Larcker 1981).

Competing measurement models were examined for a one-factor model ($\chi^2$ =316.81, $df$ = 44, p<.01, RMSEA = .180), two two-factor models, one with the conceptualization and negotiation dimensions collapsed ($\chi^2$ = 220.01, $df$ = 43, p<.01, RMSEA = .146) and one with complexity-focused as separate ($\chi^2$ = 204.92, $df$ = 43, p<.01, RMSEA = .140), a three-factor model where the Responsive and Integrative dimensions were combined ($\chi^2$ = 128.06, $df$ = 41, p<.01, RMSEA = .105), and a four-factor model with no correlation between the factors ($\chi^2$ = 97.90, $df$ = 44, p<.01, RMSEA = .080). The four-factor model with correlated dimensions provides a better fit relative to these competing models.

15.2.2 Construct Validity

Convergent validity of the scale can be assessed by examining the strength of the factor loading of each observed item on its proposed factor. First, the coefficient for one indicator corresponding to each factor is fixed to 1.00. The t-values corresponding to all of the other items are then tested for significance. All of the corresponding t values were equal to 4.193 and above ($p < 0.001$). Since these t-values were all significant, convergent validity is confirmed (Mathwick, Malhotra, and Rigdon 2001). To further confirm the existence of convergent validity, the SMCs for all of the 11 items averaged 55.43 percent (Anderson and Gerbing 1988).

To assess discriminant validity, the Rational-Experiential Inventory (Pacini and Epstein 1999) (40 items loading on 2 factors) was included in the survey. Discriminant validity is assessed by fixing the estimated correlation ($\varphi$) parameter between the construct to 1.0 and then performing a $\chi^2$ difference test (Anderson and Gerbing 1988). A significantly lower $\chi^2$ value for the model in which the correlations are not constrained to unity indicates that discriminant validity is met. The chi-square tests that were performed reveal that discriminant validity is indicated between both dimensions (Rational and Experiential) of the REI and all dimensions (Connected, Complexity-focused, Responsive, and Integrative) of the CDS scale as well as the summated 11-item CDS scale.

### 15.2.3 Second-order Model Comparisons

To explore a potential hierarchical structure of CDS, a second-order model was compared with the first-order model as previously described. Since CDS1 and CDS2 reflect the manner in which a consumer conceptualizes or thinks about a high-stakes decision situation and CDS3 and CDS4 reflect the manner in which a consumer

negotiates the decision process to arrive at a choice, it may be argued that the conceptualization factors may drive the variance in the negotiation factors. Thus, this alternative model was compared with the original four-factor model. This model included four paths between the conceptualization factors and the negotiation factors allowing both conceptualization factors to load on both of the negotiation factors. The model produced a $\chi^2 = 70.32$, $df = 39$, $p < 0.01$. These model fit indices were compared with the original model ($\chi^2 = 49.96$, $df = 38$, $p = 0.093$) and showed worse fit. A $\chi^2$-difference test also provides evidence that the first-order model fits the data better than the second order model. Thus, the first-order model was used to test the predictive validity of the scale in the studies described below.

### 15.3 Study Three: Replication and Reliability of Scale across Decision Scenarios

A third study was used to replicate the structure of the CDS scale, to assess the generalizability of the scale across decision scenarios and to test the predictive validity of the scale using a sample of university students. In order to have more than two items as indicators for each factor, 11 additional items were added to the 11-item scale as derived in the previous study. More specifically, one positive item and one reverse-worded item were added to the 'Responsive' dimension, making a total of six items. Again, one positive and one reverse-worded item were added to the 'Complexity-focused' dimension, making a total of five items. For the 'Integrative' dimension, two positive items and one reverse-worded item were added, making a total of five items. For 'Connected', three positive items and one reverse-worded item were added, totaling six items in all. Please refer to Appendix C to find the items which were included in the study three survey (Version A).

The CDS scale, as well as a variety of measures used for the predictive validity tests, was administered to a new sample of university students, from which we can further assess the validity and reliability of the scale. The initial sample size was equal to 276; however, after the deletion of nine responses due to missing and inconsistent data, the final sample size was equal to 267. 169 males (63.3%) and 98 females (36.7%) completed the survey. The average age of respondents was 20.86 years old.

To assist in assessing the reliability of the scale, four versions of the survey were created. This allowed us to test the generalizability of the scale across high-stakes decision situations and also whether responses were consistent whether individuals were given just a general definition of high-stakes decision or they were provided with a specific scenario. For version A of the survey, n = 68. For version B of the survey, n = 65. For version C of the survey, n = 67. For version D of the survey, n = 67. Each survey included two different high-stakes decision scenarios for assessing predictive validity – a financial investment decision involving going back to graduate school and a health care decision involving choice of chemotherapy treatment.

Version A of the survey first asked respondents to answer the items related to CDS given just a general definition of high-stakes decisions. Then they were give the investment scenario and asked to answer questions to assess the predictive validity of the scale within this context. They were again administered the CDS scale and given a simple reminder of the general definition of high-stakes decisions. Next they were provided with the health care scenario and finished the survey by answering questions to assess the predictive validity of the scale within this context. Version A will allow us to

assess the basic test-retest validity of the CDS scale. In addition, the order of the scale items were randomized from the first administration to the second.

Version B of the survey started off the same as version A; respondents were first administered the CDS scale given a general definition of high-stakes decisions. Then they were provided with the investment scenario and asked to answer questions to assess the predictive validity of the scale within this context. However, then the respondents were provided with the health care scenario before being administered the CDS scale for the second time. Version B will allow us to assess whether responses are consistent from responding to the items with just a general idea of high-stakes decisions to responding to the items given a specific health-care scenario.

Version C of the survey was reversed from Version B. Respondents answered the CDS items specifically referring to the investment scenario; however, they were given just a brief reminder of the definition of high-stakes decisions before responding to the CDS items for the second time (before given healthcare scenario). Version C will again allow us to assess the consistency of responses from responding to the items based on high-stakes decisions in general and then with a specific investment scenario.

In Version D of the survey, respondents answered the CDS items specifically referring to both scenarios. This will allow us to assess the consistency of their responses across two different high-stakes decision scenarios.

Before testing the reliability and generalizability of the CDS scale it is important to assess if any of the items should be deleted from the scale since new items were added prior to this study as well as examine scale structure. Exploratory factor analysis (principal axis with oblimin rotation) was used to examine the dimensionality of the scale

items across conditions. Based on the scree plots and the average variance explained by the factors, a three factor solution was decided upon and 11 items (6 new and 5 old) were removed that did not load on only one factor. This leaves an 11 item scale with the dimensions 'Connected', 'Complexity-focused', and 'Responsive/Integrative'. Conceptually, the remaining factors are quite similar to the factors that were derived in the previous study; however, it was determined that for the sake of parsimony and consistency in results across the data collection conditions, the Responsive and Integrative (negotiation) dimensions that were separate in the previous study combine in this study and the Complexity and Connectedness (conceptualization) dimensions would remain as described in the previous study.

Although there were slight variations in the size of item loadings across the conditions, the pattern was quite consistent across all conditions. The solutions generally showed three items capturing variability in the 'Connected' (CDS1) dimension, which represents the extent to which a person conceptualizes high-stakes decisions as situations which connect them to others. Another three items consistently captured the variability in the 'Complexity-focused' (CDS2) dimension, which concerns the extent to which a person conceptualizes the decision situation as inherently complex and unpredictable. And five items were chosen to represent the 'Responsive/Integrative' (CDS3) dimension, which represents the extent to which a person acts in a collaborative and open manner to negotiate the decision process. These items exhibited the most desirable psychometric properties and high loadings on only one factor (Hair et al. 1998). Thus, a total of 11 items were included in the CDS scale, six tapping into conceptualization of a high-stakes decision and five tapping into negotiation of a high-stakes decision. At this point, the

coefficient alpha was .804 across the pooled first administration of the scale and .842 across the pooled second administration of the scale.

To further evaluate the scale structure structure, a model specifying three latent factors underlying CDS was estimated in LISREL (Jöreskog and Sörbom 1996) using confirmatory factor analysis with each of the correlation matrices for the pooled investment and healthcare scenarios. For the investment scenario, $\chi^2 = 81.52_{(41df)}$, $p < .01$; RMSEA = .061; CFI = .967. In addition, 69.22 percent of the variance was explained by the scale structure for the investment scenario. For the healthcare scenario, $\chi^2 = 101.91_{(41df)}$, $p < .01$; RMSEA = .075; CFI = .961. 72.11 percent of the variance was explained by the scale structure for the healthcare scenario. Please refer to Figures 1 and 2 for a visual depiction of these results.

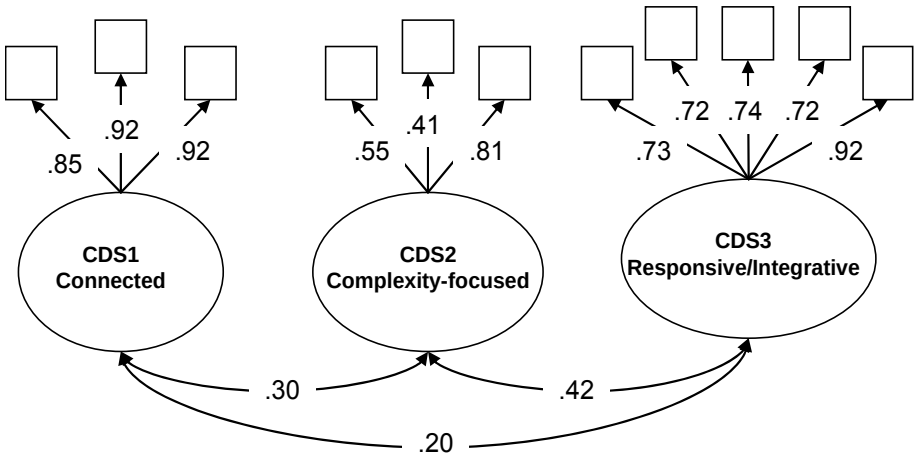


**Figure 1**
CDS Scale Structure – Investment Scenario

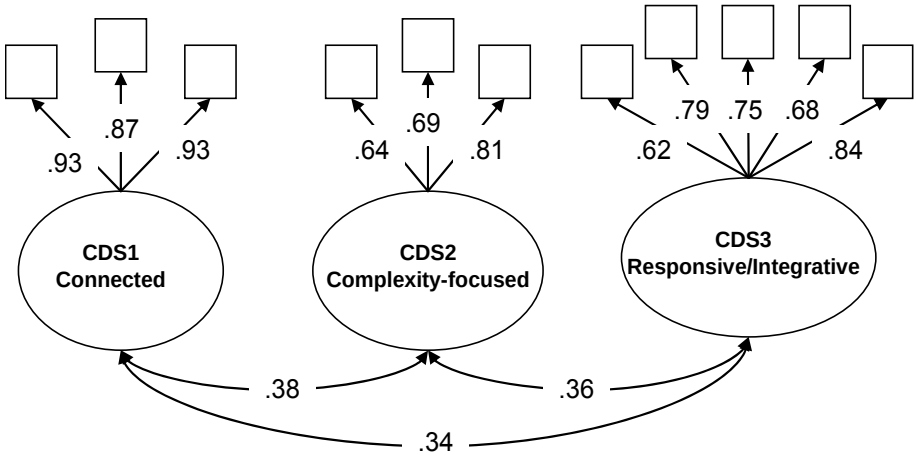


**Figure 2**
CDS Scale Structure – Healthcare Scenario

The consistency of responses from the first administration to second administration of the scale will now be tested for each version of the survey. First the basic test-retest reliability within the subset of respondents who completed Version A of the survey will be assessed. The correlation between responses on the summated CDS scale equals 0.766 ($p < .001$) which provides evidence supporting the reliability of the CDS scale when it is administered with a brief explanation of the meaning of a high-stakes consumer decision.

Second, the consistency between responses when individuals were first exposed to the CDS scale with only a general definition and then given a specific healthcare scenario as a point of reference will be assessed. This can be done by looking at the subset of respondents who completed Version B of the survey. The correlation between responses on the complete CDS scale equals 0.500 ($p < .001$).

Third, the consistency between responses when individuals were first exposed to the CDS scale with the specific investment scenario as a point of reference and then

given only a general definition will be assessed. This can be done by looking at the subset of respondents who completed Version C of the survey. The correlation between responses on the complete CDS scale equals 0.803 ($p < .001$).

Lastly, the consistency between responses to the CDS items across the investment and healthcare scenarios will be assessed. This can be done by looking at the subset of respondents who completed Version D of the survey. The correlation between responses on the complete CDS scale equals 0.224 ($p < .05$).

Before moving on to the predictive validity tests, the CDS scale was correlated across various demographic factors and with one scale included for a test of discriminant validity, namely, the 'Need for Cognitive Closure' scale (coefficient alpha = .709). First, the summated CDS scale was correlated with the demographic variables (age, race, sex) for each administration. There were no significant correlations. Next, CDS and its dimensions were correlated with the summated NCC scale for the pooled first and second administration conditions. Again, there were no significant correlations.

### 15.4 Studies Three and Four: Predictive Validity of the Scale

Predictive validity is defined as "the degree to which predictions from a formal theoretical network containing the concept under scrutiny are confirmed" (Bearden, Netemeyer, and Mobley 1993; p. 5). To gain evidence of predictive validity, various antecedent and consequential effects related to the construct of interest must be examined (Iacobucci, Ostrom, and Grayson 1995). Since CDS is defined as an individual difference variable, we concentrate on testing the predictive validity of the scale with respect to consequential effects. Thus, relationships between this individual difference measure and

various decision-making variables of interest are predicted. Please refer to Figure 3 for a depiction of the variables that are expected to be associated with CDS.

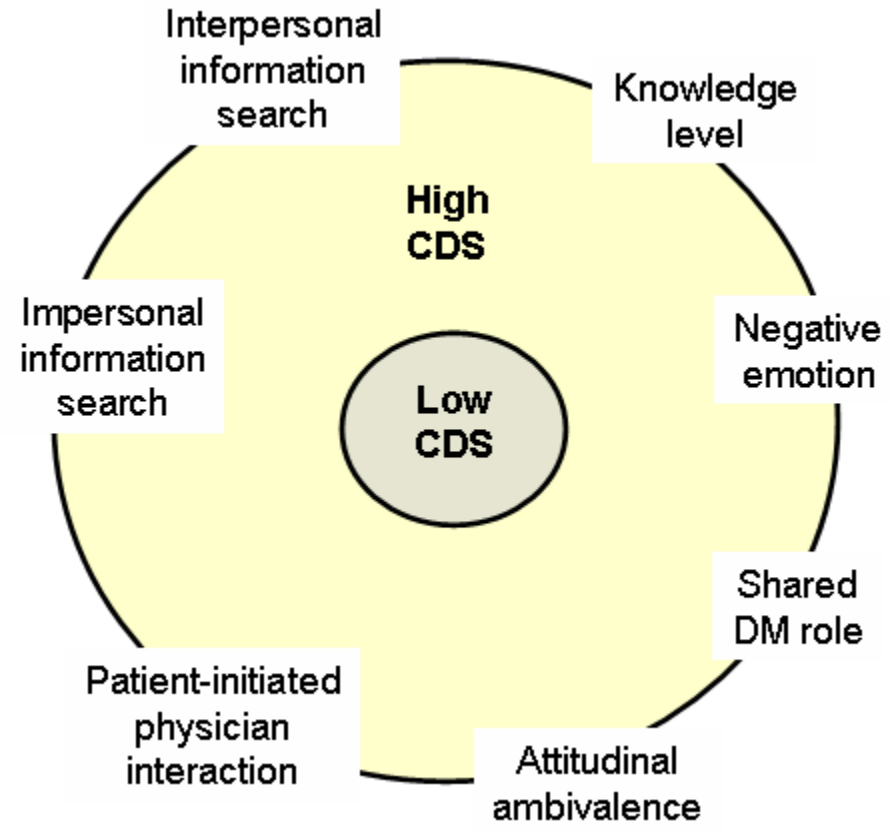


**Figure 3**
Predictive Validity of CDS Scale

The consumer literature also supports the reliance on both professionals as well as laypeople for information, recommendations, and word-of-mouth evaluations (Gershoff, Mukherjee, and Mukhopadhyay 2007; Gershoff and Johar 2006). According to the tenets of complexity science and cognitive style theory, which provide the theoretical foundation for the development of the CDS scale, individuals high in CDS are more likely to act in a consistently collaborative manner throughout the decision process.

Decision agents acting in a complex manner are more likely to value and listen to others' opinions and involve important others in the decision process instead of acting in an autonomous manner. They conceptualize the decision situation as one which connects them to others in contrast to feeling isolated and alone. Therefore, we expect that an individual with the tendency to use a CDS will feel a greater need to seek out and consider the opinions of important others throughout the decision process. Thus, a positive relationship is expected between CDS and the level of interpersonal information search that an individual engages in regarding the decision or choice behavior in question.

Because they conceptualize the decision situation as relatively unpredictable, unknowable, and becoming increasingly more complicated as time passes, high-CDS individuals will want to continuously update their information throughout the decision process to adapt to changes in the situation. In addition, high-CDS individuals are more likely to integrate a variety of information in order to gain an understanding of the 'big picture' before making a choice. As supported in consumer research, recognizing and accepting a greater level of uncertainty about one's current situating should also lead to more extensive search (Cox 1967; Lanzetta 1963). However, external information can be broadly classified as coming from both interpersonal sources and impersonal sources (see Cho and Lee 2006; Lee and Cho 2005; Murray 1991). Therefore, we expect that individuals high on CDS will also engage in a higher level of impersonal information search from a variety of information sources (e.g., TV, magazines, scientific articles, etc.) before making a decision. Thus, a positive association is expected between CDS and the level of interpersonal information search regarding the decision and the level of

impersonal information search regarding the decision. In addition, because of their tendency to engage in a more extensive information search regarding the decision, including both subjective and objective sources of information, the expectation is that individuals high in CDS will have a higher objective knowledge level regarding their choice options compared to individuals low in CDS. Thus, a positive relationship is also expected between CDS and an individual's knowledge level regarding the choice options.

Consumer decisions often evoke negative emotions when they require resolution of conflicts between valued goals (Luce 1998). Decision-task-related emotion is defined as an affective state that results directly from and is focused on a choice with which on is currently engaged (Luce 1998). According to Lazarus's (Lazarus 1991; Folkman and Lazarus 1988) theory of emotion elicitation, negative emotion is increased as important goals to the decision maker (e.g., health, survival, financial expenses) are being threatened or blocked as one's situation changes. However, it is suggested that there are individual differences in the extent to which individuals may generate negative emotion in response to a threat (e.g., Olson and Zanna 1982).

One way in which individuals may be able to cope with a stressful decision-making process is by seeking the social support and/or advice of others (White 2005). Previous research on social support has suggested that it acts as a 'psychological buffer' against real or imagined stressful outcomes of one's decision (Cohen and Wills 1985). Hagerty et al. (1993, p. 293) defined a state of connectedness as occurring "when a person is actively involved with another person, object, group, or environment, and that involvement promotes a sense of comfort, well-being, and anxiety-reduction." Individuals with high levels of connectedness are better able to manage their own

emotions and feelings and are less prone to anxiety (Lee and Robbins 1998). Because individuals who use a CDS when making high-stakes decisions are more participatory, collaborative and responsive to others throughout the decision process and conceptualize the experience as one in which they feel connected with others, the expectation is that they will experience less negative emotion generated by the decision process.

In the context of healthcare decisions, an individual's physician is one distinct important agent in the system that may be tapped for information regarding the decision and choice options. Although all physicians are required to provide information for patients to be able to give informed consent to their treatments, most physicians simply meet this threshold but do not exceed it. Since individuals high in CDS have a greater desire to co-participate with others throughout the decision process and arrive a consensus with others, the belief is that they will be more likely to initiate interactions with their physician regarding the decision and their choice options. Instead of acting as a passive receiver of a physician's care, they will be more active in seeking out information from their physician as well as spontaneously contacting their physician if they have any questions or concerns. They will also be more likely to prefer a shared decision role with their physician since they see themselves as connected with the physician in the system. Thus, the expectation is that CDS will be positively related to the level of patient-initiated physician interaction regarding the decision and to a preference for a shared decision making role. Specifically, individuals high in CDS will report a greater amount of patient-initiated interaction with their physician as compared to individuals low in CDS. In addition, individuals high in CDS will report a greater preference for a shared decision making role with their physician in contrast to preference for an autonomous or passive

role. These last two variables will only be measured and tested for significance in the context of healthcare decisions.

### 15.4.1 Predictive Validity with Student Sample

As an initial test of the predictive validity of the CDS scale, responses from a sample of university students presented with one scenario involving choice of elective healthcare treatment and one scenario involving choice of financial investment will be used. Both of these scenarios represent a high-stakes decision situation which involves subjectively risky and important outcomes. For each scenario respondents will be told to pretend that they are the decision maker as described and will need to choose a course of action.

The survey used for study four included four measures to check to make sure that each decision scenario (investment and health care) was perceived by the respondents as being high-stakes. The respondents were asked to rate the importance of the decision, risks associated with the outcomes of the decision, emotionality of the decision, and stressfulness of the decision. For the investment scenario, the average ratings on 7-point semantic differential scales (e.g., "not very important" to "very important") equaled 6.40 for importance of the decision, 4.31 for the risk associated with the outcomes of the decision, 5.34 for ratings of the emotionality of the decision, and 5.81 as the average rating for the stressfulness of the decision. And for the healthcare scenario, 6.70 for the importance of the decision, 6.49 for the risk associated with the outcomes of the decision, 6.53 for ratings of the emotionality of the decision, and 6.55 as the average rating for the stressfulness of the decision. All of the average values were statistically greater than the midpoint (4) of the scale, which indicates that these decisions were considered to be high-

stakes, i.e., risky, important, emotional, and stressful. In addition, for the investment scenario, 43.8% chose to enroll in graduate school whereas 56.2% chose to not to enroll in graduate school. For the healthcare scenario, about 61% chose the chemotherapy treatment whereas about 39% chose not to take the chemotherapy treatment. These statistics show that for both scenarios there was not a clear-cut choice, which is descriptive of a high-stakes decision situation.

To test for predictive validity in the fourth study, variables were measured that are expected to be associated with consumers' decision-making behaviors in high-stakes decision situations. Specifically, a positive relationship is expected between CDS and level of information search (interpersonal and impersonal) conducted regarding the decision, knowledge level, and level of self-initiated physician interaction regarding the decision (for the healthcare scenario only). In addition, a negative relationship is expected between CDS and negative emotion elicited from the decision-making process.

After being presented with each decision scenario, the respondents were asked a series of items regarding how likely it is that they would consult a variety of interpersonal information sources (7-point scale ranging from not very likely to very likely) about the decision they faced (see Duhan et al. 1997). For the investment scenario, personal sources included a friend, school advisor, relative, classmate, financial advisor, and social/support group member. For the healthcare scenario, personal sources included friend, doctor, relative, classmate, nurse, and social/support group member. They were then asked to rate the importance of each of the personal sources of information (7-point scale ranging from not very important to very important).

To measure impersonal information search, the respondents were asked how likely it was that they would consult a variety of impersonal information sources about their choice options. Across both scenarios, the list of sources included newspapers, magazines, the Internet, books, television programming, statistical reports, brochures/pamphlets, and seminars/information sessions. In addition, they were also asked to rate the importance of each of these specific information sources.

For the predictive validity tests related to information search, each analysis will be run using the summated CDS score. For the first analysis, the summated CDS score was correlated with information search regarding the decision of whether or not to enroll in graduate school. There were no significant correlations between CDS and the likelihood of using personal information sources to search ($\alpha = .674$) or the importance of personal information sources ($\alpha = .597$). Likewise, a composite measure of summated likelihood of using each personal information sources for information weighted by the importance of each personal information source was not significantly related to CDS. Regarding impersonal information search, the summated CDS scale was also not significantly related to any of the variables. CDS was also not significantly related to any of the personal or impersonal information search variables within the healthcare scenario. Thus, the hypotheses regarding the positive relationship between CDS and interpersonal and impersonal information search were not supported in this study.

In order to further assess the predictive validity of the CDS scale in the context of the healthcare scenario, respondents were asked to indicate the amount of self-initiated physician interaction that they would anticipate engaging in during the process of making the decision. They were also asked questions regarding their preferred level of

participation (decision-making role) in the decision with their physician. First, the respondents were asked to indicate the likelihood that they would initiate interaction with a physician on a variety of factors related to the decision situation such as treatment options, risks/benefits, and so on. After running the correlation analysis, the relationship between CDS and level of patient-initiated physician interaction was shown to be nonsignificant.

Self-reported preferred decision role was also measured with the prediction that CDS will be positively related to preference for a shared role in contrast to an autonomous or passive role. A variation of the Problem Solving Decision Making Scale (Deber, Kraetschmer, and Irvine 1996; Kraetschmer et al. 2004) was used as one measure of preferred decision role. The original scale allows respondents to indicate how much they would want to participate in both the problem-solving and decision-making aspects of healthcare treatment. Since in this study the main interest is on decision making behaviors (problem-solving refers to a situation with one optimal solution), the scale items were adopted accordingly. Each individual was asked to respond to two items with a 5-point Likert scale where 1 = the doctor alone, 2 = mostly the doctor, 3 = both equally, 4 = mostly me, and 5 = me alone. Individuals with a mean score of less than 3 are classified as passive, individuals with a mean score of 3 to 3.99 are classified as shared, and individuals with a mean score of greater than or equal to 4 are classified as autonomous. Based on Spearman's correlation coefficients, there were no significant relationships between CDS and preferred decision-making role.

### 15.4.2 Predictive Validity with Normal Population Sample

In addition to testing the predictive validity of the CDS scale using a sample of university students and their responses to scenario-based questions, predictive validity was also assessed in a fourth study using a normal population sample of middle-aged women. In this study, respondents were directed to refer to a specific choice that they have made in the past, are currently making, or anticipate making in the near future. This choice is whether or not to use Hormone Replacement Therapy (HRT). Again, positive relationships are expected between CDS and (1) the level of interpersonal and impersonal information search conducted regarding the decision to use HRT, (2) self-reported objective knowledge regarding HRT use, and (3) the amount of patient-initiated physician interaction regarding the decision. In addition, a negative relationship between CDS and the level of negative emotion elicited by the decision making process is expected.

For each decision scenario the respondents also indicated the level of negative emotion that they would expect to experience from the decision-making process. Specifically, they were asked to respond to a variety of adjective terms using a Likert-type scale reflecting how well each term described how they would feel if they actually had to make the relevant decision (Luce 1998). The adjective checklist included items from the Watson, Clark, and Tellegen (1988) PANAS scale. Similar to Luce (1998), other adjectives were added that are particularly relevant to high-stakes decision making. The relationship between elicited negative emotion and CDS was nonsignificant.

#### 15.4.2.1 Study Four Sample

For study four the sample was recruited using a modified snowball technique. More specifically, a group of university students and personal acquaintances were asked

to identify respondents who meet the sample requirements. The respondents were then hand-delivered or mailed a hard-copy of the survey and returned it back either to the person who recruited them in a sealed envelope or mailed it directly to the researcher. An individual met the sample requirements if they were a woman between the ages of 40 and 60. McKinlay, Brambilla and Posner (1992) report that the average menopausal transition, or the time when vasomotor symptoms peak, occurs around age 47. An NIH report documents that the median age of women experiencing the beginning of menopause is 50 to 51 years (NIH 2005). A woman is not considered to be postmenopausal until 12 months since her last menstrual cycle, which usually occurs naturally between the ages of 45 and 54 (www.menopause.org). As Griffiths (1999) points out, there are few adult women under the age of 65 who have not heard of HRT or who have not thought about taking it, although it may not yet be relevant for them (Griffiths and Jones 1995). After reading a statement of consent and identity confidentiality, respondents who agreed to consent to the research were then asked a series of self-report questions.

After data collection was complete, the initial sample size was equal to 392. However, 23 responses were deleted because of obvious inconsistent responses, a large amount of missing data, or because they did not meet the sample requirement (i.e., too young or too old). This left a final sample size of 369. The average respondent age was 50.38 with a median of 51. 86.4% considered themselves to be of White or Caucasian ethnicity, 10.6% Black or African American, 1.1% Hispanic, 0.3% Asian, and 1.6% indicated their race/ethnicity as 'Other'. 4.9% indicated that they were single and never married, 81% married, 11.4% separated or divorced, and 2.7% widowed. In addition, the

majority of the respondents had a college degree. In fact 33.7% had received a college graduate degree as their highest level of education, 32.9% had received an undergraduate degree, 19.3% some college, 3.3% a trade school degree, 10.6% a high school degree, and 0.3% grade school only. 72.1% were employed full time, 14.8% part-time, and 13.1% not in paid employment. As far as income, 37.4% indicated that they made over $80,000 per year, 15.4% $60,000 to $80,000, 23.7% $40,000 to $60000, 15.5% $20,000 to $40,000, 3.7% $10,000 to $20,000 and 2.3% less than $10,000. 1.4% indicated that they were unsure of their income level. In addition, 97.8% of the women indicated that they had health insurance coverage. Please refer to Table 6 for a summary of the study four sample characteristics.

**Table 6**
Study Four Sample Characteristics

| Characteristic | n | % | Characteristic | n | % |
|---|---|---|---|---|---|
| **Age** | | | **Breast self-exam** | | |
| < 50 | 162 | 43.9 | Never | 23 | 6.2 |
| 50-59 | 187 | 50.7 | 1-3 times per year | 80 | 21.7 |
| ≥ 60 | 20 | 5.4 | Once every 2-4 years | 146 | 39.6 |
| **Race/Ethnicity** | | | At least once per month | 120 | 32.5 |
| White | 318 | 86.4 | **Mammogram** | | |
| Black | 39 | 10.6 | Never | 17 | 4.6 |
| Hispanic | 4 | 1.1 | Once every 5 years or more | 17 | 4.6 |
| Asian | 1 | 0.3 | Once every 2-4 years | 65 | 17.6 |
| Other | 6 | 1.6 | At least once per year | 270 | 73.2 |
| **Education** | | | **Hysterectomy** | | |
| College graduate degree | 124 | 33.7 | Yes | 84 | 22.8 |
| College undergrad degree | 121 | 32.9 | **Illness or disease diagnosis** | | |
| Some college | 71 | 19.3 | Yes | 57 | 15.4 |
| Trade school degree | 12 | 3.3 | **Menstrual cycle** | | |
| High school degree | 39 | 10.6 | Regular (1-3 mos. apart) | 142 | 39.0 |
| < High school degree | 1 | 0.3 | Irregular (3-12 mos. apart) | 33 | 9.1 |
| **Annual Income** | | | None | 51.2 | 51.9 |
| ≤ $20,000 | 21 | 657 | **Menopausal symptoms** | | |
| $20,001-$40,000 | 55 | 15.5 | None | 104 | 28.6 |
| $40,001-$60,000 | 84 | 23.7 | Mild | 112 | 30.8 |
| $60,001-$80,000 | 57 | 15.4 | Moderate | 112 | 30.8 |
| > $80,000 | 138 | 37.4 | Severe | 28 | 7.7 |
| **Marriage** | | | Very severe | 8 | 2.2 |
| Single | 18 | 4.9 | **HRT Use** | | |
| Married | 298 | 81.0 | None | 244 | 66.1 |
| Divorced | 42 | 11.4 | Current | 55 | 14.9 |
| Widowed | 10 | 2.7 | Past | 70 | 19.0 |

An additional set of questions asked on the survey referred to the individual's reproductive stage, her history of hormone therapy use, the climacteric symptoms that she has experienced and level and history of healthcare related to women's issues. The women were first asked if they were experiencing the symptoms of menopause or perimenopause. According to the International Menopause Society and the Council of Affiliated Menopause Societies (CAMS), menopause or natural menopause refers to the biological event of the cessation of menstruation due to loss of ovarian follicular activity (Conboy, Domar and O'Connell 2001). A woman is considered post-menopausal if she has not experienced a menstrual cycle in over 12 months. 'Climacteric' is the term that is currently preferred in the medical field to refer to this phase of life in which a woman transitions from a reproductive to a non-reproductive state. The climacteric may extend before the perimenopause, through perimenopause, menopause and post menopause. The phrase 'climacteric syndrome' is used to refer to the symptoms that sometimes occur with the climacteric (Utian 1999). However, since this change in terminology is rather recent, most individuals are not familiar with the term climacteric and are more familiar with the term menopause to refer to these experiences. In this study the term menopause was used. In addition to the self-report items, the climacteric status of the sample will also be assessed by asking the respondents to indicate how often they are experiencing a menstrual period (regularly or 1-3 months apart, irregularly or 3-12 months apart, no period for more than 12 months). Technically, women are considered perimenopausal after they are experiencing an irregular period.

60.7% of the respondents indicated that they were experiencing what they perceived as the symptoms of menopause or perimenopause. Of those that were

experiencing symptoms, 1.7% rated the symptoms as fairly nonexistent, 39.8% rated the severity of the symptoms as mild, 44.8% as moderate, 10.5% as severe, and 3.2% as very severe. As a more objective measure of reproductive status, the respondents were also asked how often they were experiencing a menstrual period. 39% indicated that they were experiencing a regular menstrual cycle, 9.1% an irregular cycle, and 51.9% no cycle. To compare these objective responses to the subjective responses, those who indicated that they were experiencing a period either irregularly or experiencing no period were combined and re-coded as 'perimenopausal/menopausal' (61%). A cross-tabulation analysis was then conducted with this variable and responses to the perception-based question. The cross-tabulation analysis showed a significant relationship between the reports of a subjective experience of symptoms of menopause/perimenopause and an objective measure based on menstrual cycle (Pearson's chi-square = 17.872, df = 1, $p<.001$). Specifically, 69.7% of those who indicated that they were 'experiencing' the symptoms of menopause/perimenopause also indicated that their menstrual cycles were either irregular or nonexistent. On the other hand, 30.3% of those who indicated that they were experiencing symptoms said that they still had a regular period. There were also a percentage of respondents who indicated that they had either an irregular or nonexistent menstrual cycle but were experiencing no symptoms (30.6%). This may be due to either the mild extremity of symptoms, measures taken to relieve symptoms (e.g., HRT), or surgical cessation of the menstrual cycle (e.g., hysterectomy).

The respondents were also asked to report the level of gynecological care that they currently receive and the types of healthcare provisions they take with respect to women's healthcare issues. 55% of the respondents indicated that they had had a

discussion about HRT use with their primary gynecological health care provider. 32.5% indicated that they regularly (at least once per month) conduct a breast self-exam, 39.6% occasionally (every 2-3 months), 21.7% rarely (1-3 times per year), and 6.2% never. 73.2% indicated that they have a regular (at least once per year) professional breast cancer screening (i.e., mammogram), 17.6% occasionally (once every 2-4 years), 4.6% rarely (once every 5 years or more), and 4.6% never. In addition, 78.7% indicated that they have a regular (at least once per year) cervical cancer screening (i.e., pap smear), 17.4% occasionally (once every 2-4 years), 2.5% rarely (once every 5 years or more), and 1.4% never.

The respondents were also asked about their healthcare history, specifically if they have ever been diagnosed with a serious disease or illness. 15.4% indicated that they had with the most common responses being breast cancer, melanoma, diabetes, high blood pressure and other heart related issues. In addition, 22.8% of our respondents indicated that they had had a hysterectomy or endometrial ablation (i.e., removal or destruction of the lining of the uterus).

The respondents were also asked about their HRT use, namely if they are currently using HRT or if they have used HRT treatment in the past. HRT is a general term that is commonly used to refer to hormones (estrogen and progesterone or estrogen alone) used by women who are going through or have been through menopause (Griffiths 1999). Regarding hormone therapy (HRT) use, where HRT is defined as estrogen treatment or estrogen treatment combined with other hormones such as progestogen, progestin or progesterone, 66.1% indicated that they had never used HRT, 14.9% indicated that they were currently using HRT, and 19% indicated that they had used HRT

in the past. Thus, a total of 33.9% were either currently using HRT or had used HRT in the past.

In addition, HRT use was compared within the categories of those who were and were not experiencing menopausal symptoms and within the categories of those who were and were not experiencing a regular menstrual period. Specifically, of those who indicated that they were experiencing menopausal symptoms (n=221), 63.3% had never used HRT, 17.2% were currently using HRT, and 19.5% had used HRT in the past. Of those who indicated that they were not experiencing menopausal symptoms (n=143), 71.3% had never used HRT, 11.9% were currently using HRT, and 16.8% had used HRT in the past. Of those who reported experiencing an irregular or nonexistent menstrual cycle, 49.5% had never used HRT, 22.1% were currently using HRT, and 28.4% had used HRT in the past. Of those who reported experiencing a regular menstrual cycle, 93% had never used HRT, 4.2% were currently using HRT, and 2.8% reported past use of HRT.

The healthcare and demographic variables were also correlated which resulted in a number of significant correlations ($p < .05$). First, between age and hysterectomy (.136), breast self-exam (.113), mammogram (.256), and discussion with health care provider about HRT (.502). Education was related to pap smear (.151) and hysterectomy (.136). Mammogram was related to both breast self-exam (.134) and pap smear (.435). In addition, discussion with HC provider regarding HRT was related to hysterectomy (.179), breast self-exam (.126) and mammogram (.146).

In addition, HRT use was correlated with the various demographic and HRT-related variables. The significant correlations ($p < .05$) were between HRT use and age

(.470), discussion with healthcare provider about HRT (.530), disease or illness diagnosis (-.107), and hysterectomy (-.280). Both the subjective and objective measures of menopausal status were also correlated with the healthcare-related variables. Severity of symptoms was significantly ($p < .05$) related to discussion of HRT with a healthcare provider (.323) and HRT use (.255). The experience of menopausal symptoms was related to discussion with healthcare provider (.189). In addition, the irregular or nonexistent experience of a menstrual cycle was related to frequency of mammogram (.132) and hysterectomy (.321). And, as expected, those who were experiencing a regular menstrual period were less likely to have had a discussion with a healthcare provider regarding HRT use (-.521).

15.4.2.2 Replication of the Scale Structure

Before testing the predictive validity of the CDS scale within the context of HRT use, CDS scale structure is once again examined in order to assess the generalizability of the scale and its underlying dimensions to a non-student sample. LISREL was used to estimate a model specifying the three latent factors (Connected, Complexity-focused, and Responsive/Integrative) underlying CDS. A three factor solution with a total of 11 indicators accounted for approximately 70.27% of the total variance ($\alpha = .813$). The measurement model also showed good fit with $\chi^2 = 76.09_{(41df)}$, $p < .01$; RMSEA = .057; CFI = .969. Please refer to Table 7 for a summary description of the scale structure as replicated in this study.

**Table 7**
Study Four CDS Scale Structure and Final CDS Scale Items

| Item | Coefficient Alpha (α) | Composite Reliability (CR) | Standardized Loadings (SL) |
|---|---|---|---|
| **Connected:** | | | |
| …an experience that unites me with others | .920 | .922 | .84* |
| …a situation in which I feel connected to others | | | .94 (t=19.79) |
| …an experience that connects me to others | | | .90 (t=18.76) |
| **Complexity-focused:** | | | |
| …a situation that is relatively unpredictable | .677 | .689 | .48* |
| … a situation that gets increasingly more complicated as time passes | | | .69 (t=6.09) |
| …a constantly changing situation | | | .77 (t=5.85) |
| **Responsive/Integrative:** | | | |
| …carefully considering the opinions of others | .864 | .868 | .72* |
| …focusing on the variation in others' opinions | | | .68 (t=10.41) |
| …seeking out divergent viewpoints regarding the situation | | | .63 (t=9.65) |
| …soliciting others' thoughts regarding the situation | | | .85 (t=12.94) |
| …exploring the diversity among others' opinions | | | .87 (t=13.21) |

*the coefficient for the indicator was fixed to 1 to calculate significance of other paths.

15.4.2.3 Predictive Validity in the Context of Decisions Regarding Hormone Replacement Therapy (HRT) Use

For the predictive validity tests in this study, a variety of self-report items were included in the questionnaire regarding the women's decisions of whether or not to use HRT. Please refer to Table 8 for a summary of the measures and their correlations. Respondents were first asked to report on items that assessed the level of their interpersonal information search. The expectation is that there will be a positive relationship between CDS and the level of interpersonal information search. To test this, respondents were asked to rate the extent to which they consulted in the past or would expect to consult in the future a variety of personal sources for information regarding the decision of whether or not to use HRT. These sources included a friend, doctor, classmate, relative, nurse and social or support group member. The ratings were made on a 7-point scale where 1 = "a limited extent" and 7 = "a great extent". A similar series of Likert-scaled questions were provided regarding the impersonal (media-based or objective) sources of information that they have consulted or anticipate to consult regarding the decision of whether or not to use HRT. These sources included newspapers, magazines, the Internet, books, television programming, statistical reports, brochures/pamphlets, seminars/information sessions, and radio programming. Again, the expectation is that there will be a positive relationship between CDS and the level of impersonal information search. The summated CDS scale was positively correlated with likelihood of consulting personal sources for information (alpha = .798) ($\beta = .329$, $p < .01$) and likelihood of consulting impersonal sources of information (alpha = .897) ($\beta = .255$, $p < .01$).

**Table 8**
Study Four Correlations and Measurement Items

| Measure | Correlations | | | | | | α |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1. Objective knowledge level | --- | | | | | | .965 |
| 2. Level of interpersonal information search | -.035 | --- | | | | | .798 |
| 3. Level of impersonal information search | .011 | .411** | --- | | | | .897 |
| 4. Preference for shared decision role | .097 | .106* | .125* | --- | | | na |
| 5. Preference for autonomous decision role | .076 | .102 | -.019 | -.436** | --- | | na |
| 6. Level of patient-initiated physician interaction | .116* | .250** | .216** | .277** | -.171** | --- | .886 |
| 7. Perceived negative emotion | -.099 | .182** | .209** | -.077 | .020 | .073 | .867 |

As classified by Braddock et al. (1999), the elements of informed decision making include a discussion of (1) the patient's role in the decision making process, (2) the clinical issue or nature of the decision, (3) the choice alternatives, (4) the pros (potential benefits) and cons (potential risks) of the alternatives, (5) the uncertainties associated with the choice options, (6) the patient's understanding of the choice options, and (7) the patient's preference. The next step in the test of predictive validity is to assess each respondent's level of patient-initiated physician interaction pertaining to the decision of whether or not to use HRT. This was accomplished by asking the respondents to provide

self-report ratings of the likelihood of initiating an interaction with a health care provider regarding four factors related to HRT use (risks, benefits, choice preferences, and costs associated with choice options). Then, a summated scale to measure likelihood of initiating a discussion with physician was computed (alpha = .886). As anticipated, there was a positive relationship between CDS and level of patient-initiated physician interaction ($\beta = .157$, $p < .01$).

The respondent's preferred role (autonomous or patient-centered, passive or physician-centered, or shared) in the decision of whether or not to use HRT is also expected to be positively associated with CDS. By definition, passive patients prefer to hand over the responsibility for decision making to the physicians whereas autonomous patients prefer to keep the responsibility for decision making to themselves. In contrast, shared patients prefer to share in the decision making responsibility with their physician (Kraetschmer et al. 2004; Say, Murtagh, and Thomson 2005). Preferred role was measured by asking the respondents to indicate their extent of agreement or disagreement to a series of statements pertaining to their level of participation in the decision process. Two items were used to tap into each decision making role (autonomous, passive or shared). As expected, the overall CDS scale was positively related to preferring a shared role ($\beta = .180$, $p < .01$) but negatively related to preferring to make the decision 'all by myself' ($\beta = -.115$, $p < .05$).

Following a procedure similar to that used in study three, the extent of actual or anticipated negative emotion that is elicited from the decision making process was also measured. Referring to their decision of whether or not to use HRT, respondents measured the level of negative emotion that was or that they would expect to be elicited

from the decision-making process. This was accomplished by having the women respond to adjective terms using a Likert-type scale reflecting how well each term described how they would feel if they actually had to make the relevant decision (Luce 1998). The respondents were also asked to rate their overall feeling of negative emotion that they experienced or that they anticipate to experience as a result of this decision process. Contrary to what was predicted, the CDS scale was positively related to an overall rating of negative emotion (3-item scale, alpha = .867) ($\beta = .125$, $p < .05$). This may be explained because high-CDS consumers are more likely to view the decision situation as inherently unpredictable and also put forth more effort in their information search, which makes it more likely that they will encounter contradictory information.

As a final test of the predictive validity of the CDS scale, CDS was expected to have a positive relationship with knowledge level regarding HRT. The respondents were asked to answer a set of questions (true-false) related to the benefits and risks of HRT use as an objective measure of their individual knowledge level. Surprisingly, there was not a significant relationship between objective knowledge level and CDS. So, CDS is positively related to information search but not knowledge level. One explanation for this is that through their information search, the women are being exposed to conflicting reports related to risks and benefits, so they may not know what to believe as true. Since HRT was introduced about 75 years ago, a steady flow of studies has produced evidence of both harmful and beneficial effects, often contradicting one another. There are also conflicting predictions regarding risks and benefits based on whether progestin is taken with the estrogen or not.

# CHAPTER 16

# CONCEPTUAL MODEL OF CHOICE OF ELECTIVE HEALTHCARE TREATMENT

It is commonly espoused that the healthcare field is "perhaps the most complex of any area of the economy" (Morrison, 2000, p. xvii). Complexity is reflected in the number, variety, and fragmentation of agents involved in the delivery of healthcare including potential patients (consumers), actual patients (consumers), professionals, provider organizations, buyer organizations, insurance organizations, and suppliers. Hundreds of different types of professionals and organizations interact to provide a wide variety of services to patients, their families, and their communities. As agents acting within this complex environment, individuals are often faced with high-stakes decisions involving subjectively risky outcomes.

Not only is the entire healthcare system becoming more complex, but healthcare decision making is becoming increasingly complicated, unpredictable, and patient-directed. In the past, individual healthcare was mainly controlled by health professionals or care providers by identifying the possible 'causes' of a disease or infection and taking the appropriate steps to remove, treat, or cure them. Today, however, health treatments have moved from reflecting a linear cause-and-effect approach to considering a myriad of factors (e.g., genetic predisposition, environmental context, lifestyles, values, etc.) in order to determine an appropriate course of action (Plsek and Greenhalgh 2001). In addition, healthcare decision making is becoming much more self-focused, with health professionals instructed to give informed consent and then rely on the patient to make their own decision (Fagerlin, Zikmund-Fisher, and Ubel 2005). Because decisions are

becoming more consumer-oriented, we must create a better understanding of the inputs into patients' judgments and satisfaction.

Also adding to the complex nature of individual healthcare decision making is the immense amount of information published and made available by a myriad of stakeholder groups (government, private-practice, non-for-profit, Internet, etc.). Often times, the data from these organizations are conflicting, or may be incomplete or even incorrect. In addition, patients are not very adept at understanding individual risks associated with different treatment options, especially when they are provided with population (relative) estimates instead of absolute risk levels. Numerical information is often poorly understood by patients, and even doctors themselves (Bowling and Ebrahim 2001). Common errors include compression bias (tendency to overestimate small risks and underestimate large ones), miscalibration bias (overestimation of the level and accuracy of one's knowledge), availability bias (overestimation of obvious risks), and optimism-pessimism bias (tendency of patients to believe that they are at less risk of an adverse outcome than people similar to them) (Bogardus, Holmboe, and Jenkel 1999; Bowling and Ebrahim 2001).

Interestingly, the inundation of consumers with information corresponds to an increased emphasis on patient empowerment and informed or shared decision making (Foundation for Informed Medical Decision Making, www.fimdm.org), and while many individuals consider this an improvement in the system, many others do not wish to become this involved in high-stakes decisions, especially when it comes to healthcare (Say, Murtagh, and Thomson 2006). Previous research has found patient preferences for involvement in decision making to vary with age, socioeconomic status, illness

experience, and the gravity of the decision. However, as supported through the development of the CDS scale, there is also a fundamental difference in the way people prefer and tend to approach and negotiate these types of decision situations. In addition, this preferred decision style may influence the importance of various inputs into the decision making process. A measurement tool such as the decision style scale could be especially useful in promoting optimal decision making if it is found to be related to the importance of various behavioral influences.

### 16.1 Decision to Use Hormone Replacement Therapy

There are a number of reasons to support the opinion that choices involving hormone replacement therapy (HRT) will provide a timely and important arena to study high-stakes consumer decision making. First, this decision situation possesses the characteristics of a high-stakes consumer decision as described in the literature (Kahn and Baron 1995; Kahn and Luce 2003; White 2005). Since HRT was introduced 70 years ago, a steady flow of studies has produced evidence of both harmful and beneficial effects (Rymer, Wilson and Ballard 2003), which increases the risk involved in a woman's choice of whether or not to take HRT. In addition, use of HRT remains controversial because there is uncertainty about the reliability and validity of available information regarding treatment (Conboy, Domar, and O'Connell 2001; Rymer, Wilson, and Ballard, 2003). Thus, outcome uncertainty is involved. Publications released from the heart and estrogen-progestin replacement study (HERS; Hlatky et al. 2002; Hulley et al. 1998) and the women's health initiative study (WHI; Writing Group for the Women's Health Initiative Investigators 2002) report a variety of adverse effects and has added to the confusion related to HRT. The decision process will also most likely generate negative

emotion and stress. As pointed out in the consumer behavior literature, these types of decisions are increasingly common in today's consumer decision environment (White 2005).

Second, there are over 30 million women in the United States who are post-menopausal and are faced with considering the risks and benefits of HRT (Bastian et al. 2002). In fact, the use of HRT has been most prevalent in cultures where the biomedical perspective is dominant, such as in the United States (Spatz et al. 2003). Today most women will live approximately one-third of their lives past the stage of menopause (NIH 2005). The treatment most often offered by healthcare providers to treat climacteric symptoms from estrogen deficiency is hormone replacement therapy. Current medical standards also advocate the use of HRT as appropriate for all woman of a certain age, not just for those who are experiencing climacteric symptoms (Conboy, Domar, and O'Connell 2001). Some estimates show that nearly one-half of postmenopausal women in the United States have used different forms of HRT at one time (CDC 2007). However, this estimate varies by study design and population from only about 15% (Sheehy 1992) to 54% (Faulkner et al. 1998). Recent British studies have shown that about 45% of women tried taking HRT by the time they were 50 (Rymer, Wilson, and Ballard 2003). Another estimate shows that in the United States, about 38% of postmenopausal women take HRT (Rymer, Wilson and Ballard 2003). In 2000, 46 million prescriptions were written for Premarin (conjugated equine estrogens) making it the second most frequently prescribed drug in the United States (Fletcher and Colditz 2002). This suggests that we should further examine the important correlates of HRT use and that we can expect

enough variance in our sample to allow us to study both the antecedents and consequences of the actual or anticipated decision to use (or not to use) HRT.

Third, women are increasingly encouraged to participate in making decisions about HRT; therefore, instead of being a more medicalized, expert-focused decision it is becoming a more individualized, consumer-focused decision. This shift in focus corresponds with the increasing importance of developing sophisticated decision support systems, the effectiveness of which may vary depending on a consumer's decision style. It is often assumed that an increase in dissemination of information and education of patients will increase adherence to medical recommendations (Sinclair, Bond, and Taylor 1993). However, simply educating women or increasing patient involvement may not change or improve women's choices (Fagerlin, Zikmund-Fisher, and Ubel 2005). There are a variety of other factors that influence healthcare choices such as ones beliefs about health and medicine in general, personal opinions regarding menopause and the medicalization of what they perceive as a 'natural' condition, and socially influenced norms regarding HRT use (Lauver et al. 1999). If the variables that explain women's choices regarding hormone therapy use were better understood, then physicians and marketing managers could integrate this knowledge into facilitating optimal choices (Lauver et al. 1999). In order to develop more effective interventions to aid in optimal decision making, a better understanding of the mechanisms through which these types of decisions are made is needed.

### 16.2 Conceptual Model Development

Two general and well-regarded theories of behavior are the theory of reasoned action (Ajzen and Fishbein 1973; Fishbein and Ajzen 1975) and the theory of planned

behavior (Ajzen 1988, 1991; Ajzen and Madden 1986; Schifter and Ajzen 1985). These models have been used in the prediction of a wide range of behaviors (see reviews by Ajzen 1991; Eagly and Chaiken 1993; Sheppard, Hartwick, and Warshaw 1988) and have shown strong predictive validity (Ajzen and Fishbein 1973; Albarracín, Johnson, and Fishbein 2001; Sheppard, Hartwick, and Warshaw 1988). For example, Armitage and Conner (2001) empirically summarized research conducted within the context of the TPB and found that the model accounted for 27% and 39% of the variance in behavior and intention across 185 separate studies. In addition, attitudes and subjective norms, two of the most important predictors included in these models, typically account for 40-50% of the variance in behavioral intentions (e.g., Ajzen 1991; Armitage and Conner 2001; Sheeran and Taylor 1999; Sheppard, Hartwick, and Warshaw 1988).

The TPB, and its predecessor, the TRA, are based on the premise that one's behavior is influenced by a set of psychological variables, most importantly intention, attitude toward the behavior, subjective norm, perceived behavioral control, and behavioral, normative, and control beliefs. These models have been used to effectively predict the adoption or continued adherence to many health-related behaviors, including the use of medication (Godin and Kok 1996). Specifically, attitudes and subjective norms are extremely useful predictors of health-related behaviors (Ajzen and Fishbein 1980; Finlay, Trafimow and Jones 1997; Trafimow 1994). These behaviors include such things as exercising, blood donation, following a diet, using condoms, using drugs, using safety equipment, choosing a career, and many more (Ajzen 2001; Armitage and Conner 2001; Sutton 1998). As you can see from the list above, it is often applied to situations in which people are faced with high-stakes decisions that lead to the performance of certain

behaviors (Davis et al. 2002). In fact, Fishbein's attitude model can be viewed as a multi-attribute decision theory model in choice situations where the decision is made under conditions of risk and utility is additive (Etter 1975).

In the past, the TRA and TPB have also been applied to the decision to engage in volitional health behaviors, and of particular interest here, the decision to use HRT (e.g., Fisher et al. 2000; Quine and Rubin 1997; Spatz et al. 2003). Spatz et al. (2003) assessed the behavioral intentions of women to use HRT in various stages of menopause. Specifically, the intentions of both premenopausal women and current HRT users were of interest. The authors propose that use of HRT is influenced by three major factors, which are consistent with Fishbein and Ajzen's model: (1) a favorable or unfavorable evaluation of use of hormone therapy (attitude), (2) perceived social pressure to use hormone therapy (subjective norm), and (3) self-efficacy or perceptions of control in relation to using hormone therapy (PBC). The authors also point out that by focusing on these subjective psychological constructs, they are not denying the importance of other factors that may influence one's decision of whether or not to use HRT such as family conflicts, poverty or health (Spatz et al. 2003). In fact, the TPB very practically assumes that other determinants influence behaviors indirectly by affecting attitudes, subjective norms, and PBC (Davis, Bagozzi, and Warshaw 1989).

Fisher et al. (2000), in their study of HRT use, argue that if a woman holds positive attitudes towards HRT and perceives that important others support her use of HRT, she will be more likely to have intentions to initiate HRT, actually use HRT, and maintain use of HRT over time. The authors use the TRA to examine women's intentions to use or to continue to use HRT as a function of their personal attitudes, perceptions of

social support, and perceptions of the advantages and disadvantages of HRT in a sample of pre-, peri-, and post-menopausal women. As followed in this study, Fisher et al. (2000) justify the use of their diverse sample of pre-, peri-, and post-menopausal women. They argue that pre-menopausal women (mid-40s) are already searching and paying attention to information regarding use of HRT, which is the first step in forming beliefs about HRT use that will be utilized in their decision within the next several years. Peri-menopausal women (late 40s or early 50s) are in the midst of the actual decision making stage. Furthermore, postmenopausal women (late 50s or early 60s) may still be considering HRT use because of the long-term protective effects of HRT for cardiovascular disease and osteoporosis.

It is important when designing measures to test a model based on the TPB that the target behavior is carefully defined in terms of its target, action, context and time (TACT) (Centre for Health Services Research Manual 2004). Thus, in this study the focus is on attitudes, subjective norms, perceived behavioral control, and intentions regarding HRT use. Consistent with the TPB, the expectation is that attitudes, subjective norms, and perceived behavioral control will all be positively related to intentions to use or intentions to continue to use HRT.

In addition to attitudes, which are determined by beliefs regarding the advantages (benefits) and disadvantages (risks) of HRT use, subjective norms, and perceived behavioral control, there are other variables that may influence attitude towards HRT use and intention to use or intention to continue to use HRT. First, in the original formulation of the TRA, there was no clear distinction between affective and evaluative responses to a behavior (Ajzen 1991). Any summary response towards an attitude object that could be

assessed with a bipolar dimension of favorability from negative to positive was considered an input into one's overall attitude (Ajzen and Fishbein 1980; Fishbein and Ajzen 1975). However, in recent years, much research has been conducted to support the distinction between perceived pros and cons of performing a behavior (evaluative judgments) and positive and negative feelings towards performing a behavior (affective influences). The affective-component of attitudes refers to emotions, feelings, and drives associated with an attitude object, while the cognitive (or evaluative) component addresses beliefs, judgments and thoughts associated with the object (Breckler and Wiggins 1989). Affective responses, specifically in the context of HRT use, have rarely been empirically assessed as determinants of health-related behaviors (Lauver et al. 1999). However, in previous quantitative and qualitative studies (e.g., Brett and Madans 1997; Légaré et al. 2003; Pilote and Hlatky 1995), women express specific emotions or feelings directed towards the use of HRT. This is consistent with the affective-cognitive dichotomy that reflects a duality between heart and mind that has long been assumed in Western cultures (Giner-Sorolla 2004).

Empirical evidence supporting the separation of an affective and evaluative (or cognitive) component of attitudes has been provided in a number of ways (Verplanken, Hofstee, and Janssen 1998). First, studies have shown higher correlations within than between measures of each component (Crites, Fabrigar, and Petty 1994; Trafimow and Sheeran 1998). Second, there are studies that demonstrate the individual prediction of each component to a global measure of attitude (Breckler 1984; Breckler and Wiggins 1989; Crites, Fabrigar, and Petty 1994; Haddock, Zanna, and Esses 1994). Third, some studies illustrate a distinction between affectively-based and cognitively-based attitudes

(Edwards 1990; Edwards and Von Hippel 1995). Fourth, there are a number of studies that show how each component is differentially related to other constructs, such as behavioral intentions or behavior (Millar and Tesser 1986; Simons and Carey 1998). Finally, studies based on response times have shown differences in the accessibility of affective and cognitive components of attitudes (Verplanken, Hofstee and Janssen 1998). These results support the validity of a multi-component model of attitudes (Eagly and Chaiken 1993). In the context of this study, the expectation is that women who have more positive affective responses toward HRT use will have more positive attitudes towards HRT use compared to women who have more negative affective responses toward HRT use.

In addition to attitudes towards HRT, we expect that an individual's attitude towards menopause in general will also influence an individual's intention to use or continue to use HRT. Menopause signifies the end of a woman's reproductive life and the beginning of an increased risk for the health consequences of estrogen deprivation (Matthews 1992). However, it also marks the beginning of a new freedom that comes from not having regular menstrual cycles or having to worry about unwanted pregnancies (Matthews 1992). Menopause is a biological event by definition, but it is a psychosocial one as well (Sommer et al. 1999). It occurs at a time in life when many women are experiencing changing roles, responsibilities, and relationships that accompany aging in general and the maturation of children (Matthews 1992). These changes are emotional and create considerable stress for some women, affecting their identity, self-esteem, and social relationships. For others, these might mark the beginning of more fulfilling relationships and new challenges that lead to positive psychological growth. Although

researchers have documented the negative attitudes that women may have toward menopause; some women may actually have positive expectations and beliefs about the menopausal experience (Matthews 1992). In this study, we hypothesize that attitudes toward menopause in general will be positively related to intentions to use or continue to use HRT. Viewing menopause as a positive event will help motivate women to embrace the change and effectively treat the symptoms in order to enjoy the positive aspects while managing the negative consequences.

Individuals often rely on the advice of trusted sources under conditions of high perceived risk (Perry and Hamm 1969; White 2005). Similar to social norms, albeit at a more personal level, specific physicians' recommendations for hormones have influenced women's use of hormones positively (Ferguson, Hoegh, and Johnson 1989; Mansfield and Voda 1998). Thus, in this study, physician opinion regarding HRT use was also measured to test the prediction that physician support regarding HRT use will be positively related to intentions to use or intentions to continue to use HRT.

## 16.3 Mean-Level Research Hypotheses

The hypotheses developed below are based on the influence of CDS on the mean level of constructs important in the prediction of intentions to use HRT. Specifically, the focus is on attitude towards HRT use and attitudinal ambivalence.

### 16.3.1 The Influence of CDS on Attitude towards HRT Use

High-CDS individuals are more likely then low-CDS individuals to seek out and consider all possible sources of information. They also tend to focus on the differences and variation among other's opinions. In this sense, high-CDS individuals are more likely to hear a variety of different opinions and accumulate a higher level of overall

information regarding a decision or the alternative choice options at hand. In high-stakes decision situations, which typically involve the consideration of risk-laden alternatives, individuals will be exposed to both positive and negative characteristics of the attitude object or behavior under consideration. High-CDS individuals will encounter an even greater level and variety of positive and negative information that they must integrate to form an overall attitude. This will lead high-CDS individuals to have more complex or well-developed schemas for the attitude object or behavior under consideration.

Tesser and Leone (1977) suggest that using a complex schema to think about attitude objects produces more attitude polarization than using a simple schema (see also Chaiken and Yates 1985). Tesser suggested that thought changes the cognitive representations of the stimulus by adding evaluatively consistent cognitions, and suppressing or losing inconsistent cognitions. Such cognitive changes are not random; they are under the direction of a cognitive schema. The schema serves as a blueprint for cognitive change. In the absence of schemas there would be few changes and little polarization. Hence a well-developed cognitive schema should result in more polarization than a poorly developed schema. Note that this research assumes that individuals have an automatic approach/avoidance response to a behavior. This is consistent with the fundamental work on biased assimilation of mixed evidence and attitude polarization (Lord, Ross and Lepper 1979) that posits that people who hold attitudes on important issues are more likely to examine relevant incoming information in a biased manner by accepting 'confirming' evidence and discounting 'disconfirming' evidence. Thus, belief polarization will increase, rather than decrease or remain unchanged, when mixed or inconclusive findings are assimilated.

Similarly, work by Fazio and his colleagues (see Powell and Fazio 1984) demonstrates that repeated expressions of attitude responses affect attitude accessibility. Then, according to the mere-exposure literature (Zajonc 1968), repeated expression should lead to greater attitude extremity. In other words, repeated exposure to an object can lead to more polarized appraisals of the object assuming that exposure is likely to be accompanied by repeated implicit expressions of the evaluation of the object (Downing, Judd and Brauer 1992). This evidence supports that of Tesser and his colleagues (Tesser and Leone 1977) as described above, who show that extended thought devoted to an attitude object results in attitude polarization. In summary, this literature asserts that cognitive engagement with a topic, as well as evaluation of mixed evidence associated with a topic, are both likely to lead to attitude polarization (Kuhn and Lao 1996). Because high-CDS individuals are expected to engage in a higher level of thinking about and searching for information regarding the use of HRT, then this will result in more repeated explicit or implicit expressions of their opinions regarding HRT use. Because of these repeated expressions and the biased assimilation of information, high-CDS individuals will experience greater attitude polarization, and less attitudinal ambivalence, regarding the use of hormone therapy.

**H1:** Feelings of attitudinal ambivalence regarding the use of HRT will be lower among high-CDS individuals than among low-CDS individuals.

**H2:** High-CDS individuals will have more extreme (favorable or unfavorable) overall attitudes regarding HRT use compared to low-CDS individuals who will have more moderate or neutral attitudes regarding HRT use.

## 16.4 Structural Relationship Strength Hypotheses

The hypotheses developed above predicted differences in the mean level of attitudinal ambivalence based on CDS. This section will discuss hypotheses developed on differences in the strength of mediation relationships between research constructs based on CDS.

### 16.4.1 The Influence of CDS on Determinants of Attitude towards HRT Use

Attitudes can be conceptualized as multi-component entities (e.g., Eagly and Chaiken 1993; Thurstone 1928). As depicted in the model of choice of elective healthcare treatment, two important inputs into the overall attitude are cognition and affect. The cognitive (knowing) component contains the encoding of attributes and beliefs about the attitude object and the affective (feeling) component contains the encoding of emotions and feelings associated with the object (Millar and Millar 1998). Considerable theoretical support has been given for the distinction between affect and cognition (e.g., Breckler 1984; Breckler and Wiggins 1989, 1991; Zajonc 1980, 1984). The relationship between one's overall or 'global' evaluation/attitude and the affective and cognitive components has also been explored. This research suggests that it is possible for one's attitude to be more strongly influenced by either the affective or cognitive component. The importance of affect versus cognition can depend on what type of behavior is being predicted (e.g., Breckler and Wiggins 1989). In addition, there may also be individual differences in

whether, across a wide range of behaviors, people may be more under affective or cognitive control (e.g., Trafimow et al. 2004). Trafimow et al. (2004) conducted three studies that confirmed that some people are more under affective control across a range of behaviors whereas other people are more under cognitive control.

In the literature on high-stakes decision making, Kunreuther et al. (2002) argues that some people may have a tendency to make these types of decisions using heuristics or more general rules of thumb. They point out that affect and emotions strongly influence decisions involving uncertain outcomes with large consequences (Slovic et al. 2001; Loewenstein et al. 2001). Decisions that require difficult trade-offs between attributes or involve ambiguity as to what would constitute a 'right' answer may lead some individuals to choose based on the cues that send the strongest affective signals. When high-stakes decisions produce high levels of perceived stress or anxiety, as is likely for low-CDS individuals, decisions makers may focus on a selective set of cues when evaluating options (e.g., Kahn and Baron 1995; Ben Zur and Breznitz 1981; Kahn and Luce 2003) and make greater use of simplifying heuristics (e.g., Luce, Bettman, and Payne 1997). They may rely on making a choice based on the affective association they have with the attitude object or behavior (i.e., use an affect heuristic; Slovic et al. 2001) instead of engaging in a more thorough analysis of the situation. Thus, we expect that low-CDS individuals will be more likely to rely on affective responses to form an overall attitude towards HRT use as compared to high-CDS individuals, who will be more likely to rely on cognitive beliefs.

**H3:** The positive influence of cognitive beliefs regarding HRT use on attitude towards HRT use will be stronger among high-CDS individuals than among low-CDS individuals.

**H4:** The positive influence of affective responses towards HRT use on attitude towards HRT use will be stronger among low-CDS individuals than among high-CDS individuals.

### 16.4.2 The Influence of CDS on Determinants of Intention to Use HRT

One characteristic of high-stakes decisions is that decision makers must resolve difficult trade-offs, often involving life-and-death situations, with no obvious right answer. When faced with these types of decisions some individuals have the common reaction of not wanting to make a decision at all (Kunreuther et al. 2002). Some people may say "I'd rather not think about it" or avoid making the decision themselves by relying on an agent to make it for them (Kunreuther et al. 2002, p. 263; Schwartz et al. 2002). In the healthcare literature it has been documented that "some patients just don't want to be involved" (Say and Thomson 2003, p. 543). This may be because they feel they lack the knowledge and experience to develop informed preferences or are afraid of making the wrong decision. Theroux and Taylor (2003) conducted a study that found that women's need for information, advice and input differed depending on their desire for engagement in the decision making process regarding hormone therapy and that some women preferred a 'non-decision-making' role where they opted to simply follow the advice of their doctor, trusting that they would make the best clinical decision for them.

In contrast to high-CDS individuals, who have a desire to search for information, independently integrate conflicting opinions, and act in a more hands-on manner throughout the decision process, low-CDS individuals are likely to depend on more general inputs to make a decision. In other words, they do not want to 'get their hands dirty' with all the details. Because they are hesitant to embrace the inherent unpredictability and complexity of the situation, they attempt to cope by minimizing the amount of cognitive thought that goes into the decision making process, and more specifically, into detailing and evaluating the risks and benefits of engaging in the particular behavior under consideration.

By discussing the situation with others and engaging in an extensive information search, high-CDS individuals will gain confidence in their opinions and their individually-created attitude towards the behavior. Thus, they will be more likely to use this attitude as an input into their intention to engage in the behavior. In contrast, low-CDS individuals will either avoid creating an attitude in the first place or have less confidence in this attitude and will rely on more general inputs, such as their physician's opinion, attitudes towards menopause and medicine in general. In other words, they will have a stronger reliance of pre-existing knowledge structures. Thus, we expect that attitude towards HRT will be a stronger predictor of intentions to use HRT for high-CDS individuals compared with low-CDS individuals. In contrast, attitude towards menopause in general, attitude towards medicine in general, and physician opinion regarding HRT use will be a stronger predictor of intentions to use HRT for low-CDS individuals compared with high-CDS individuals.

**H5:** The positive influence of attitude towards HRT use on intention to use HRT will be stronger among high-CDS individuals than among low-CDS individuals.

**H6:** The positive influence of attitude towards menopause in general on intention to use HRT will be stronger among low-CDS individuals than among high-CDS individuals.

**H7:** The positive influence of physician opinion regarding HRT use on intention to use HRT will be stronger among low-CDS individuals than among high-CDS individuals.

A central feature of most high-stakes decisions is that they are high in procedural uncertainty. In other words, individuals have relatively little experience dealing with them and are highly uncertain about how to resolve them (Hogarth, Michaud and Mery 1980). A natural adaptation to these types of situations is to adopt the decision strategies used by others or follow established social norms (e.g., Kahn and Baron 1995). These important others that may affect the consumer decision process may be either known or unknown to the decision maker, present during the choice task or simply imagined (McGrath and Otnes 1995; Ratner and Khan 2002). Trafimow and Finlay (1996, 2001) have argued that not only can behaviors be under attitudinal or normative control, but people may be as well. In a study measuring attitudes, subjective norms, and intentions for 30 behaviors, 21% of the respondents were found to be normatively controlled

persons. Finlay, Trafimow and Jones (1997) confirmed this assertion within the domain of health-related behaviors.

Individuals may differ in the level of social influence over their decisions (Bearden, Netemeyer, and Teel 1989) so that some tend to conform more to the expectations of others. However, this is different than seeking out opinions and information from important others as inputs into one's own individual evaluation. In the case of informational interpersonal influence, individuals accept information from others as evidence about reality (Bearden, Netemeyer, and Teel 1989; Deutsch and Gerard 1955). People may acquire this information from direct contact with others or indirectly by observing the behaviors of others.

Interpersonal influence can also be manifest in a value-expressive form. Value-expressive influence happens when individuals use important other's norms, values and behaviors as a model for their own attitudes and behaviors (Mourali, Laroche, and Pons 2005a, 2005b). As argued in the marketing literature, one way in which consumers may make difficult decisions in a 'non-decision-making' manner is by "following the recommendation of others, imitating the purchase made by others, conforming to purchase-specific group norms, and complying to a request by others" (Formisano, Olshavsky, and Tapp 1982, p. 475). Similar to our previous argument, low-CDS individuals are more likely to use heuristics as inputs into intention formation compared to high-CDS individuals. Relying on subjective norms is one manner in which low-CDS individuals can avoid complicating the situation by conducting an extensive information search or involving others in their decision making process. In other words, it is one effective way of choosing "not to engage in decision making" (Formisano, Olshavsky,

and Tapp 1982, p. 478). Thus, we predict that subjective norms will be more influential on intentions for low-CDS individuals compared to high-CDS individuals.

**H8:** The positive influence of subjective norms regarding HRT use on intention to use HRT will be stronger among low-CDS individuals than among high-CDS individuals.

## 16.5 Analysis of the Conceptual Model and Hypotheses Tests

For the analysis, we will first assess the properties of each measurement instrument and establish measurement invariance between two groups: low-CDS individuals and high-CDS individuals. With measurement equivalence confirmed, the structural relationship strength hypotheses will be tested. The influence of common method variance will also be assessed.

### 16.5.1 Analysis of the Conceptual Model of Decision to Use HRT

The first step in the analysis of the conceptual model and hypotheses is to assess the properties of each measurement instrument. Please refer to Appendix D to see each measurement instrument in more detail. This was done by performing a confirmatory factor analysis (CFA) on the data using LISREL (Jöreskog and Sörbom 1996) in order to check the validity and reliability of the measurement items. Please refer to Table 10 to see the measurement item characteristics in more detail after the removal of items based on modification indices produced by LISREL. The chi-square of the measurement model was 390.05 with 168 degrees of freedom (*df*). The fit indices indicated that the model has good fit (CFI = .97, RMSEA = .060). As indicated in Table 9, all of the measurement

items had a completely standardized factor loading (CSL) greater than 0.60 as suggested by Bagozzi and Yi (1988). To check the reliabilities of the latent variables, composite reliability (CR) and average variance extracted (AVE) were calculated. All scales exhibited acceptable reliabilities that exceed the recommended cutoff values of CR > 0.70 and AVE > 0.50. These results indicate satisfactory construct validity and reliability of the measures. To examine the discriminant validity between the constructs, the square root of the average variance extracted was compared with the correlations between constructs. Please refer to Table 10 to see these correlations. All of the square roots of the average variance extracted were higher than the correlations with one exception between affective responses and attitude. However, this seems to pose little concern because, by definition, the two constructs are destined to be strongly correlated in many occasions since affective responses are considered an attitudinal component.

**Table 9**
Measures for Conceptual Model Test

| Items | Mean | S.D. | CSL | α | CR | AVE |
|---|---|---|---|---|---|---|
| **Cognitive beliefs** | | | | | | |
| I think that using HRT is safe (vs. unsafe). | 3.64 | 1.59 | 0.96 | 0.81 | 0.84 | 0.65 |
| I think that using HRT is valuable (vs. worthless). | 4.12 | 1.39 | 0.67 | | | |
| I think that using HRT is unhealthy (vs. healthy).* | 3.81 | 1.50 | 0.76 | | | |
| **Affective responses** | | | | | | |
| Using HRT makes or would make me feel anxious (vs. not worried).* | 3.33 | 1.57 | 0.87 | 0.83 | 0.84 | 0.63 |
| Using HRT makes or would make me feel comfortable (vs. uneasy). | 3.70 | 1.65 | 0.78 | | | |
| Using HRT makes or would make me feel nervous (vs. relaxed).* | 3.51 | 1.52 | 0.73 | | | |
| **Attitude towards menopause** | | | | | | |
| I associate the arrival of menopause with a sense of relief. | 3.78 | 1.74 | 0.79 | 0.85 | 0.84 | 0.64 |
| I have positive feelings towards menopause. | 4.04 | 1.51 | 0.80 | | | |
| Menopause is something to look forward to. | 3.46 | 1.64 | 0.81 | | | |
| **Subjective norms** | | | | | | |
| People who are important to me would recommend that I use HRT. | 3.41 | 1.65 | 0.92 | 0.93 | 0.94 | 0.84 |
| People who are important to me would encourage me to use HRT. | 3.25 | 1.66 | 0.95 | | | |
| People who are important to me would think it is appropriate for me to use HRT. | 3.38 | 1.70 | 0.87 | | | |

**Table 9 (continued)**

| Items | Mean | S.D. | CSL | α | CR | AVE |
|---|---|---|---|---|---|---|
| **Perceived behavioral control** | | | | | | |
| If I wanted to, using HRT would be very easy. | 4.97 | 1.70 | 0.83 | 0.86 | 0.87 | 0.77 |
| I am confident that I could use HRT if I wanted to. | 5.24 | 1.51 | 0.92 | | | |
| **Attitude towards HRT** | | | | | | |
| My overall attitude towards HRT use is bad (vs. good).* | 3.63 | 1.72 | 0.90 | 0.96 | 0.97 | 0.92 |
| My overall attitude towards HRT use is positive (vs. negative). | 3.61 | 1.71 | 0.99 | | | |
| My overall attitude towards HRT use is favorable (vs. unfavorable). | 3.63 | 1.71 | 0.99 | | | |
| **Intention** | | | | | | |
| I expect to use or continue to use HRT in the future. | 3.12 | 1.99 | 0.99 | 0.99 | 0.99 | 0.97 |
| I intend to use or continue to use HRT in the future. | 3.11 | 1.98 | 1.00 | | | |
| It is likely that I will use or continue to use HRT in the future. | 3.17 | 2.02 | 0.94 | | | |
| I plan to use or continue to use HRT in the future. | 3.09 | 2.00 | 1.00 | | | |

*These items were reverse-coded.

CSL = completely standardized factor loading; α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted

**Table 10**
Correlations between Model Constructs

| | Correlations | | | | | | |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| **1. Cognitive beliefs** | 0.81 | | | | | | |
| **2. Affective response** | 0.64** | 0.80 | | | | | |
| **3. Attitude towards menopause** | 0.15** | 0.03 | 0.80 | | | | |
| **4. Subjective norms** | 0.46** | 0.68** | -0.05 | 0.91 | | | |
| **5. Perceived behavioral control** | 0.17** | 0.28** | -0.13** | 0.32** | 0.88 | | |
| **6. Attitude towards HRT** | 0.62** | 0.86** | 0.02 | 0.66** | 0.31** | 0.96 | |
| **7. Intention** | 0.47** | 0.73** | -0.03 | 0.74** | 0.34** | 0.77** | 0.98 |

Note: Value on diagonal is the square root of AVE

The next step is to examine the structural relationships in the model and assess model fit. The model had a chi-square value of 406.07 with 173 degrees of freedom (*df*), $p < .01$. The fit indices showed that the model has an acceptable fit (RMSEA = .061, CFI = .97) based on the criteria published by Jaccard and Wan (1996) who suggest cutoff values of CFI > 0.90 and RMSEA < 0.08. Please refer to Table 11 to see the values of the completely standardized LISREL estimation of each path. Also refer to Figure 4 for a visual depiction of the structural model. First, the path from cognitive beliefs regarding HRT use to attitudes towards HRT use was positive but nonsignificant ($\lambda = .09$, ns). However, the path between affective responses towards HRT use and attitude towards HRT use was also positive but significant ($\lambda = 0.82$, $t = 14.17$, $p < .01$). In addition, the

results indicated that attitude had a positive and significant effect on intentions to use or continue to use HRT ($\beta = 0.49$, $t = 11.78$, $p < .01$). Also as predicted, subjective norms regarding HRT use positively and significantly predicted intentions to use or continue to use HRT ($\lambda = 0.40$, $t = 9.57$, $p < .01$). However, neither perceived behavioral control ($\lambda = .07$, ns) or attitudes towards menopause in general ($\lambda = -.01$, ns) had a significant effect on intentions to use or continue to use HRT.

**Table 11**
Structural Model Path Coefficients

| **Structural relationships in the model** | | |
|---|---|---|
| **Model fit** | Chi-square | 406.07 |
| | *df* | 173 |
| | CFI | 0.97 |
| | GFI | 0.90 |
| | RMSEA | 0.06 |
| **Paths between constructs** | Completely standardized coefficient | *t*-value |
| Cognitive beliefs → Attitude | 0.09 | 1.86 |
| Affect response → Attitude | 0.82 | 14.17* |
| Attitude towards menopause → Intention | -0.01 | -0.37 |
| Subjective norms →Intention | 0.40 | 9.57* |
| Perceived behavioral control | 0.07 | 1.94 |
| Attitude towards HRT → Intention | 0.49 | 11.78* |

*p<0.05 (two-tailed)

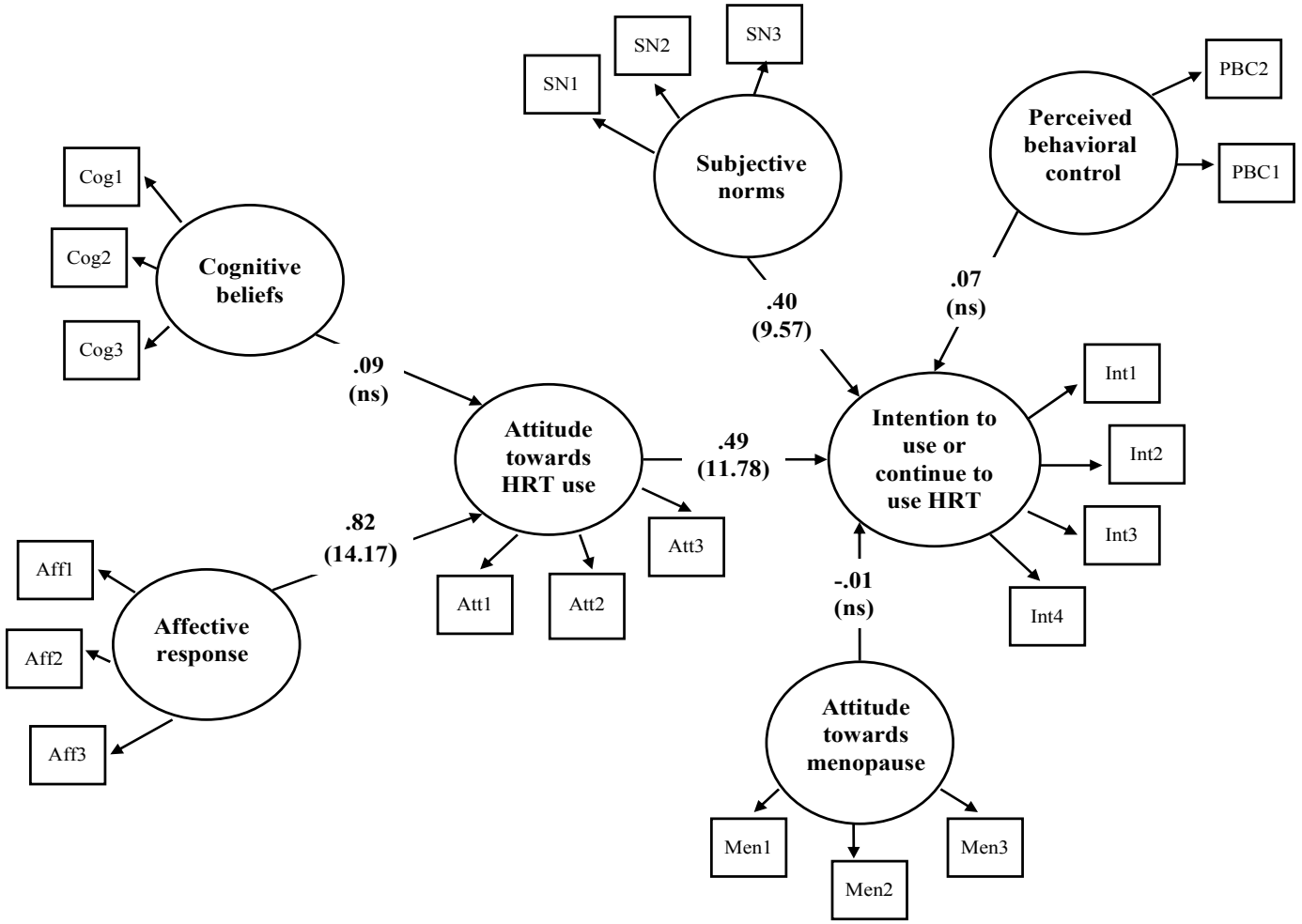


**Figure 4**
Structural Model

It is also important to assess the significance of structural relationships in the model after accounting for the effects of common method variance. In order to estimate the level of common method variance present in the data, a marker variable (material values scale; Richins and Dawson 1992) scale was embedded into the survey. The average correlation between this marker variable and the other variables included in the conceptual model (r = .109) was treated as an estimate of the level of common method variance present in the data. Based on this estimate and three more levels included for a sensitivity analysis, CMV-adjusted correlations were calculated using the equation presented in Part One. As you can see from the results of the analysis shown in Table 12, the path estimates are quite robust against estimates of CMV up to a level of 0.30.

**Table 12**
CMV Path Analysis

| | **CMV Levels** | | | |
|---|---|---|---|---|
| | **No CMV** | **w/ CMV** | **Sensitivity Test 1** | **Sensitivity Test 2** |
| **Path Analysis Coefficients:** | 0.00 | 0.109 | 0.20 | 0.30 |
| Affect → Attitude | 0.65* | 0.64* | 0.63* | 0.61* |
| Attitude → Intention | 0.47* | 0.46* | 0.43* | 0.28* |
| Subjective norms → Intention | 0.38* | 0.37* | 0.34* | 0.16* |

The nonsignificant relationship in the model between cognitive beliefs and attitudes towards HRT use was a surprising result. However, consumer information processing can be influenced by both 'hot' and 'cold' factors. In fact, some research on high-stakes decision making has shown that complexity and ambiguity as to what would

constitute a 'right' answer in a high-stakes decision situation can often lead individuals to make choices by focusing on affective cues (Kunreuther et al. 2002). This may be the case in this context regarding HRT use since most of the information that has been published regarding the risks and benefits of HRT is contradictory and often reported in the form of statistical probabilities which can be difficult to understand as a consumer. In addition, other research (e.g., Trafimow et al. 2004) shows that some behaviors, especially experiential ones such as those associated with healthcare, may be more under affective than cognitive control. Another explanation may have to do with the fact that individuals frequently treat the likelihood of outcomes associated with high-stakes losses as sufficiently low that they are not even worth worrying about. In others words, they may assume that these events would "not happen to me" so perceptions of HRT as harmful and unsafe may not have as much influence on these decisions (Kunreuther et al. 2002).

When affective responses are removed from the structural model and cognitive beliefs are left in alone then the path between cognitive beliefs and attitudes towards HRT use becomes significant. Please refer to Figure 5 for a visual depiction of this model. Thus, cognitive beliefs may be important in determining attitudes towards HRT use; however, they may not be as important as affective beliefs.

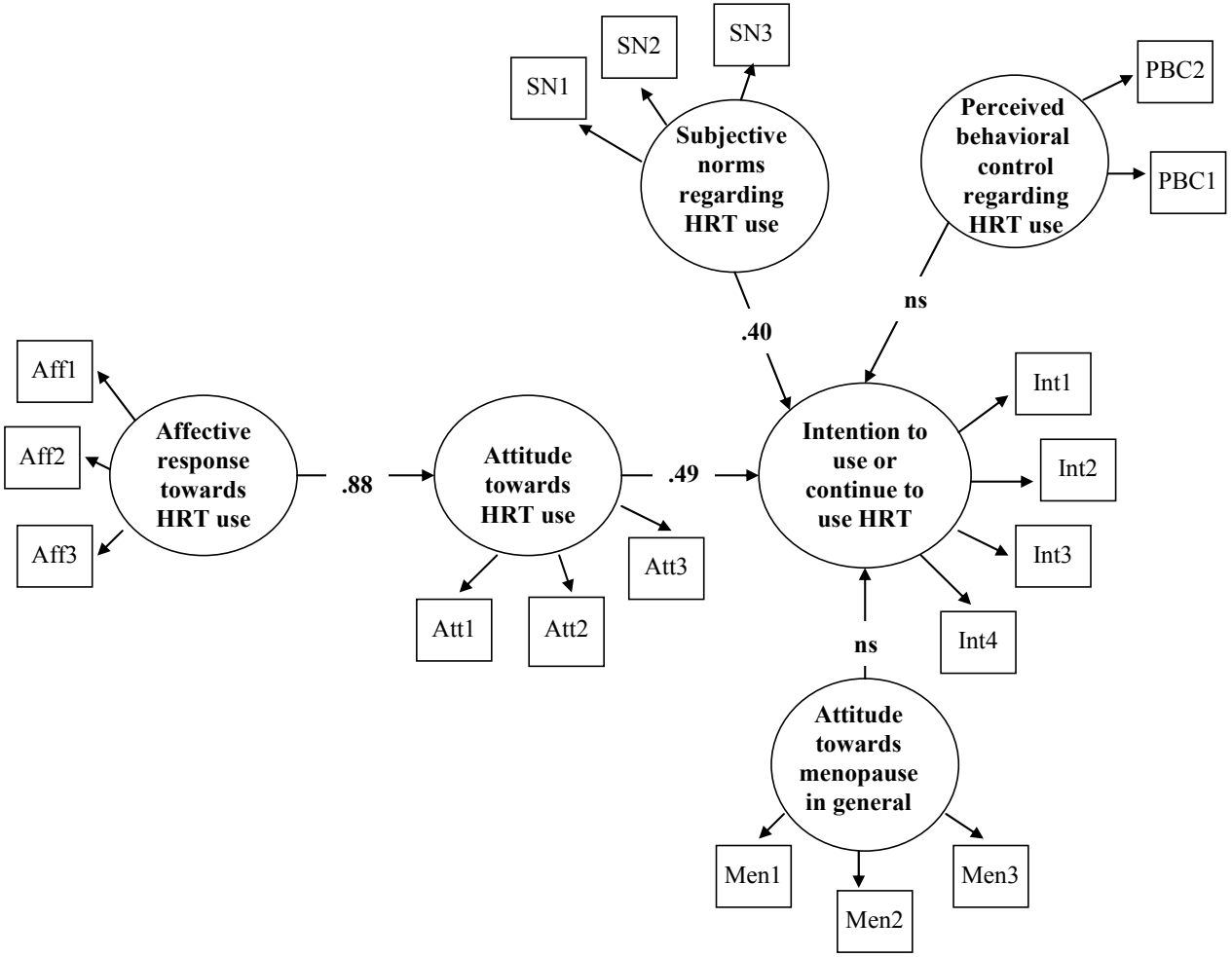


**Figure 5**
Structural Model with Affective Responses Removed

One explanation for the nonsignificant path between perceived behavioral control and intentions regarding the use of HRT in this study may be that there was not much variance in the PBC construct. An overwhelming majority of the respondents indicated that they had health insurance which will assist in payment for HRT. In addition, the sample was fairly well-educated and had a high income level. Thus, most of the respondents also indicated high levels of perceived behavioral control (mean = 5.12 on a 7 point scale). In addition, attitudes towards menopause in general did not significantly impact attitudes towards HRT although a positive relationship was predicted. This shows that the ways in which a woman feels about menopause does not affect her propensity to use HRT.

16.5.2 Analysis of the Mean-Level Hypotheses Based on CDS

To test whether CDS was related to feelings of attitudinal ambivalence, ambivalence was measured on the survey using a 4 item scale regarding how 'torn' one feels about the behavior in question. Using a t-test ($t = -4.43$, $p < .01$) to assess the mean difference in the level of ambivalence between the high and low CDS-groups, it was shown that the high-CDS individuals had a significantly higher level of feelings of ambivalence using the summated scale (mean = 16.24) compared to low-CDS individuals (mean = 13.80). Thus, Hypothesis 1 was not supported. This is a surprising result; however, there is some research to support that individuals make less, rather than more, polarized judgments about attitude objects for which they possess more extensive schemas. In addition, the large amount of information captured in these well-developed schemas makes it more likely that some of the information will be perceived as good and

some as bad regarding the behavior in question, which would make feelings towards HRT use more ambivalent (Linville 1982; Linville and Jones 1980).

Consistent with the above result, Hypothesis 2 was also not supported. There was actually no difference between the high-CDS and low-CDS groups regarding the variance of attitudes towards HRT use. This was assessed with the use of Levene's Test for Equality of Variances (F = .517, p = .472). A nonsignificant F-value rejects the hypothesis that there is a difference in variances in attitudes across the two groups.

16.5.3 Analysis of the Relationship Strength Hypotheses Based on CDS

To test the relationship strength hypotheses within the conceptual model, we must first ensure that both high (n=189) and low (n=180) CDS individuals perceive the measurement instrument in a similar manner (Steenkamp and Baumgartner 1998). If this is not the case then we may mistake what are essentially measurement inequalities with substantive differences between groups as related to the structural relationships between variables in the model. Thus, these hypotheses are each involved with determining if there is a hypothesized interaction based on CDS impacting the strength of the path between constructs included in the model of decision regarding the use of HRT.

The first step in assessing for measurement invariance is to test for configural invariance. Basically, this involves an assessment of the extent to which the observed variables fit the latent constructs in each group through a multigroup CFA in which the factor loadings in each group are allowed to vary freely. Configural invariance requires the same patterns (zero or nonzero) of item loadings across groups. In fact, the $\chi^2$ value of the configural invariance model ($\chi^2 = 509.48$) is the same as the sum of the $\chi^2$ values assessed independently based on the low-CDS ($\chi^2 = 311.14$) and high-CDS ($\chi^2 = 198.34$)

groups. This configural invariance model serves as a baseline against which more stringent forms of measurement invariance are evaluated. Please refer to Table 13 to see the development of measurement invariance across groups.

**Table 13**
Assessment of Measurement Invariance across CDS Groups

| Measurement Models | $\chi^2$ | *df* | Invariance Test | | | RMSEA | CFI | NNFI |
|---|---|---|---|---|---|---|---|---|
| | | | $\Delta\chi^2$ | *df* | p-value | | | |
| **CFA (Low-CDS)** | 311.14 | 168 | n/a | n/a | n/a | 0.069 | 0.96 | 0.96 |
| **CFA (High-CDS)** | 198.34 | 168 | n/a | n/a | n/a | 0.031 | 0.99 | 0.99 |
| **1. Configural invariance** | 509.48 | 336 | n/a | n/a | n/a | 0.053 | 0.98 | 0.97 |
| **2. Full metric invariance** | 526.66 | 350 | 17.12 | 14 | 0.25 | 0.052 | 0.98 | 0.97 |

The next step is to test for metric invariance, which involves establishing the equivalence of item loadings. This step is necessary in order to meaningfully compare structural relationships across groups. Full metric invariance was tested by imposing the same factor loadings on each model. The $\chi^2$ value of this model equaled 526.66 with 350 degrees of freedom (*df*). As shown in Table 13, the difference in the chi-square between Model 2 and Model 1 is not statistically significant ($\Delta\chi^2$ (14) = 17.12, $p > 0.05$), indicating that the requirement of metric invariance is met.

The results of the multi-group structural equation model are shown in Table 14. The model fit indices are within the boundary of the criteria suggested by Jaccard and Wan (1996) with $\chi^2 = 700.76$, df = 398, $p < .01$, RMSEA = 0.064, CFI = 0.96. In addition, the pattern of significance of the structural paths is consistent with that found

earlier with the pooled sample. The hypotheses regarding group differences in structural relationships were evaluated using chi-square difference tests. As you can see from Table 14, none of the relationship strength hypotheses were supported.

**Table 14**
Relationship Strength Hypotheses Tests

| Parameter | Low-CDS | High-CDS | $\Delta \chi^2 (1)$ | Hypotheses | Support? |
|---|---|---|---|---|---|
| **Cognition → Attitude** | 0.10 | 0.09 | 0.02 | H3 | No |
| **Affect → Attitude** | 0.83* | 0.78* | 0.07 | H4 | No |
| **Attitude → Intentions** | 0.49* | 0.44* | 0.01 | H5 | No |
| **Attitude towards menopause → Intentions** | -0.10 | -0.05 | 1.41 | H6 | No |
| **Subjective norms → Intentions** | 0.34* | 0.43* | 0.88 | H8 | No |
| **PBC → Intentions** | 0.06 | 0.07 | n/a | n/a | n/a |

Notes: *p < 0.05

However, these results may be in part due to the inclusion of respondents who fell into the middle range of the CDS scale. To determine whether this was the case, the middle 40% of the respondents based on their scores on the CDS scale were removed from the analysis. This left 112 respondents in the low-CDS group and 115 respondents in the high-CDS group. First, measurement invariance was again established between the two groups and the multi-group structural equation model was reanalyzed. Please refer to Table 15 for the development of measurement invariance and Table 16 for the results of the hypotheses tests. As you can see from the results, after removing the middle 40%, two of the structural relationship strength hypotheses were supported based on chi-square

difference tests. First, supporting Hypothesis 3, the positive influence of cognitive beliefs regarding HRT use on attitude towards HRT is stronger among high-CDS individuals than among low-CDS individuals. In addition, in support of Hypothesis 4, the positive influence of affective responses regarding HRT use on attitude towards HRT is stronger among low-CDS individuals than among high-CDS individuals.

**Table 15**
Measurement Invariance with Middle 40% Removed

| **Measurement Models** | **n** | $\chi^2$ | ***df*** | **Invariance Test** | | | **RMSEA** | **CFI** | **NNFI** |
|---|---|---|---|---|---|---|---|---|---|
| | | | | $\Delta\chi^2$ | ***df*** | **p-value** | | | |
| **CFA (Low-CDS)** | 112 | 270.73 | 168 | n/a | n/a | n/a | 0.074 | 0.98 | 0.97 |
| **CFA (High-CDS)** | 115 | 172.74 | 168 | n/a | n/a | n/a | 0.016 | 1.00 | 0.99 |
| **1. Configural invariance** | | 443.47 | 336 | n/a | n/a | n/a | 0.053 | 0.98 | 0.98 |
| **2. Full metric invariance** | | 454.94 | 350 | 11.47 | 14 | 0.65 | 0.052 | 0.98 | 0.98 |

**Table 16**
Hypotheses Tests with Middle 40% Removed

| Parameter | Low-CDS | High-CDS | $\Delta \chi^2$ (1) | Hypotheses | Support? |
|---|---|---|---|---|---|
| **Cognition → Attitude** | 0.12 | 0.28* | 7.86 | H3 | Yes |
| **Affect → Attitude** | 0.80* | 0.61* | 10.39 | H4 | Yes |
| **Attitude → Intentions** | 0.54* | 0.50* | 0.24 | H5 | No |
| **Attitude towards menopause → Intentions** | -0.06 | -0.08 | 0.01 | H6 | No |
| **Subjective norms → Intentions** | 0.27* | 0.34* | 0.94 | H8 | No |
| **PBC → Intentions** | 0.09 | 0.07 | n/a | n/a | n/a |

Notes: *$p < 0.05$

Although physician opinion was not included in the structural model since only about half of the sample reported being aware of their physician's opinion, we can still test whether CDS is related to the correlation between physician opinion and intentions to use HRT. Hypothesis 6, which predicts that the positive influence of physician opinion regarding HRT use on intention to use HRT will be stronger among low-CDS individuals than among high-CDS individuals, was tested using an assessment of the differences in correlations. First, the correlations between intentions to use HRT and physician opinion for both the low ($r = 0.516$, $n = 99$) and high ($r = .414$, $n = 102$) CDS groups were transformed to Fisher's z-scores. Then the difference between the z-scores was divided by the standard error of the difference. If this resultant z-value is greater than 1.96 then the difference between the correlations is significant. In this case, however, the value equaled 0.911 which was not significant, thus there was no difference in adherence to

physician opinion across the two groups. In addition, after removing the middle 40% of the respondents, the mean-level hypotheses remained unsupported.

# CHAPTER 17

# CONCLUSIONS FROM PART TWO

The first goal of this part of the dissertation was to provide a comprehensive literature review on cognitive styles and decision styles, with particular emphasis on the various approaches to assessing consumer decision styles. A description of complexity science and the characteristics of complex systems, focusing on consumers as agents that interact within a CAS, were also provided. Then, the need for a scale to assess decision styles within high-stakes decision situations was justified and the scale was developed. Study 1 was used to generate an initial pool of items to measure complex decision style (CDS). These items were derived either from the literature review or from responses to an exploratory questionnaire distributed to a group of university students. Study 2 was conducted for the purpose of purifying the scale items and assessing the reliability and convergent and discriminant validity of the purified scale. Study 3 further assessed the psychometric properties of the purified scale and tested the predictive validity of the scale with a sample of university students. Study 4 also tested the predictive validity of the scale with a normal population sample as well as provided a context for applying the scale within a conceptual model of consumer choice of elective healthcare treatment.

## 17.1 Theoretical and Practical Implications

There has long been interest in consumer literature regarding the ways in which consumers make decisions (Bettman 1979). Most of this research is under the assumption that consumers engage in decision making with the same goals and using the same information processing styles. However, in high-stakes decisions, this may not always be

the case and consumers may differ in respect to their preferences regarding the organization and negotiation of the decision situation. Today, healthcare patients are much more involved in their health decisions, mainly because of the overwhelming amount of information they can search for and use from healthcare providers, media sources, and the Internet (Fagerlin, Zikmund-Fisher, and Ubel 2005). As shown in previous studies, people tend to use a number of sources of information when making healthcare decisions (e.g., Conboy, Domar, and O'Connell 2001; Griffiths 1999). However, as Deber (1994) highlights, there is an often overlooked discrepancy between the push for increased patient autonomy and existing literature that appears to suggest that many patients may not wish to be active participants in health decision making. There is even evidence to suggest that certain individuals may experience disutility or increased negative emotions from being involved in decision making about the treatment of their health problems (Robinson and Thomson 2001).

As recent literature on HRT decision making has pointed out, it is also not exactly clear how women make their decisions about menopause (Murtagh and Hepworth 2005). In the context of hormone therapy, decision-making is extremely complex due to the continuing controversies and uncertainty about the effects and efficacy of HRT. Trade-offs related to potential benefits, such as reduced risk of osteoporosis and improvements in quality of life, and potential risks, such as increased risk of breast cancer and recurrent coronary events in women with existing coronary artery disease complicate HRT decisions (Bastian et al. 2002). Moreover, decision making in healthcare is a process distributed across a number of constituents and embedded in constructions of the illnesses and medical treatments under consideration (Murtagh and Hepworth 2005).

Assumptions are made that healthcare professionals are aware of the information needs of individual patients (Luker et al. 1995). However, unless we know what types of information are important to people then what is perceived as 'relevant' or 'helpful' information may not always be provided. Empirical evidence suggests that there is a difference in perception of what the person wants to know and what the healthcare professional thinks the person wants to know (Lauer, Murphy, and Powers 1982), with objective information often being perceived by people as unhelpful rather than constructive and supportive. In addition, considering the errors that many people make when evaluating scientific statistics and objective information, choices may actually transform into risks to individual well-being, although 'choice' has long been a principal demand of the women's health movement (Lippman 1999). As is shown in this study, attitudes towards healthcare behaviors may be more strongly influenced by general affective responses than by cognitive beliefs regarding the behavior under question. This has important implications for how we may want to frame behavioral interventions and decision support systems.

One final important implication of this work has to do with this shift towards more consumer-focused decision making. Often, the assumption is that we provide consumers with information, typically statistical probabilities, and place the responsibility on them to make an informed, rational choice. However, what is often overlooked is that when making these decisions, individuals operate within networks of relationships and information sources that have profound effects on the information they encounter and the ultimate choices that they make. In the terms of complexity science this is known as a "shadow system" which may be fairly predictable for some (e.g.,

soliciting the opinion of a spouse or primary physician) but more ambiguous or shifting for others (e.g., gathering information from the Internet or a trip to an alternative practitioner). From the standpoint of a physician trying to give an expert opinion, there is often a strong temptation to try to override or discredit the shadow system, but this just ignores how powerful its influence can be and the fact that the patient cannot simply walk away from or ignore it. A more productive approach is to recognize and map the shadow system and try to work alongside it. The implication of this work is that we can use the CDS scale to assist in the prediction of individuals who are more likely to have elaborate shadow systems that may influence their decision making.

In sum, the goal of this work is to provide a better understanding of the motivations behind individual differences regarding their information search, preferred role with others, and emotional reactions in high-stakes decision situations. Decision support tools can be made to vary widely, from those that support objective information exchange and active engagement in making treatment choices to those that provide normative information and support for emotional distress (Robinson and Thomson 2001). By developing the CDS scale to assess differences in consumer decision style in high-stakes decision situations, we may be able to better match the assistance that is provided to individual preferences. In the context of healthcare, if the components of a good clinical encounter are in place, the outcomes for patients are generally more positive (Salkeld et al. 2004).

### 17.2 Limitations and Future Research

There are several limitations to this research. First, the scale development process was carried out using mainly student subjects. Although in a fourth study the scale

structure was replicated and predictive validity tested with a normal population sample, it is possible that the use of student subjects led to bias in the scale development process. For future research it may be useful to conduct the scale development process within a normal population sample. One could first conduct exploratory research with a normal population talking to them about their experiences in making high-stakes decisions in order to generate scale items.

In addition, the predictive validity tests included in study three were all shown to be nonsignificant. This may have been partly a function of the research design since student subjects were provided with a fairly long survey at the very end of a one-hour required research session. There is the possibility that lack of motivation and effort may have led to overall inconsistent responses to items on the questionnaire, which influenced these tests. It may be useful to conduct future research to assess the predictive validity of the scale in an experimental study which may overcome some of the limitations of self-reports. Then important variables such as level of information search and level of physician interaction may be directly assessed.

Another limitation of the research involves the fact that there may have been other important variables that influence the decision of whether or not to use HRT that were not included in the conceptual model used in this study. The variables included here were chosen based on a thorough review of the existing qualitative and quantitative literature explaining women's choices regarding HRT; however, today there is a shift towards considering a wide variety of factors such as one's morals and values, family history, and so on before making a choice. It would be useful to conduct future

qualitative research in order to better understand the drivers of HRT use, both at an individual and a broader sociocultural level.

# APPENDIX A

Questionnaire for Study One

# Consumer Decision Style Survey I


Tracey M. King
&
Naresh K. Malhotra

Please keep in mind that there are no right or wrong answers to these questions. It is important that I gather extremely descriptive information, so try to answer all questions meaningfully and truthfully. Also, please try to fill up the space provided with each of your responses. Your answers will not be tied to your identity so please be candid in your responses to the questions. The information collected here is for research purposes only; it is not intended for commercial or any other use and will not be shared or sold.

**Instructions:** In each section, please read the questions carefully and answer with a descriptive and meaningful response. Try to fill up all of the space provided with each answer (you may use the back of the page as necessary). Some of the questions may be abstract; please answer them to the best of your ability. There is no time limit to the study, you are free to work at your own pace and continue until you have completed all sections. If you have any questions raise your hand and the moderator will come to your seat. When you are finished, please bring the survey to the front of the room. You are then free to leave quietly.

**Part I.** Please read each definition and respond to the following questions.

***Consumer Decision Making Style* refers to a mental orientation characterizing a consumer's approach to choices.**

1) What would you consider a *consumer decision making style?*

2) Give your own definition of *consumer decision making style*. Please DO NOT feel limited by the definition or example given above.

3) In your opinion, do consumers differ in terms of their *decision making styles?* Why or why not?

**Part II.** Please read each scenario and respond to the corresponding questions.

**Consumers are often faced with fairly simple decisions. For example, deciding what to eat for lunch or choosing a brand of toothpaste to purchase. Sometimes consumers are confronted with fairly complex decisions. For example, deciding which stocks to buy and sell or choosing a health care treatment.**

1) How would you define and characterize a *complex decision making situation*?

2) How would you define *complex decision making style?*

3) How do you, as a consumer, conceptualize a complex decision situation?

4) Describe the process that you, as a consumer, use to arrive at an acceptable choice in a complex decision situation?

**Part V.** Please provide the following demographic information about yourself.

1) Gender:

____ male
____ female

2) Age (in years):

_____

# APPENDIX B

Questionnaire for Study Two

# Consumer Decision Style Survey II


Tracey M. King
&
Naresh K. Malhotra

Your answers will not be tied to your identity so please be candid in your responses to the questions. The information collected here is for research purposes only; it is not intended for commercial or any other use and will not be shared or sold.

**General Instructions:** In each section, please read the questions carefully and answer with a descriptive response. Try to fill up all of the space provided for each open-ended answer (you may use the back of the page as necessary). If you are responding to a scale item, please do so in a meaningful way. Some of the questions may be abstract; just answer them to the best of your ability. There is no time limit to the study, you are free to work at your own pace and continue until you have completed all sections. Please turn the pages of the questionnaire only one at a time. If you have any questions raise your hand and the moderator will come to your seat. When you are finished, please bring the survey to the front of the room.

**Part I.**

Consumers are often faced with making important, life-altering decisions. High-stakes consumer decisions are defined as those that have subjectively important and risky outcomes. In these decision situations, consumers may feel that an important lifetime goal (e.g., safety, health, well-being, etc.) is being threatened. These decisions also tend to be emotionally difficult and generate stress. They typically involve making difficult tradeoffs among attributes associated with the choice options. Examples of high-stakes consumer decisions include decisions regarding medical treatments, financial investments, careers or education, insurance, legal issues, housing and security, among others.

Recall a time when you had to make a high-stakes consumer decision. Please describe this situation in the space provided below.

Try to put yourself back in this or any other high-stakes consumer decision situations you have experienced. Try to recall (1) how you consistently tend to think about or conceptualize the decision situation and (2) how you negotiate the decision making process to arrive at a preferred choice. Keeping this in mind, please indicate the extent to which you agree or disagree with the following statements. The scales range from 1 (strongly disagree) to 7 (strongly agree).

**I think about or conceptualize a high-stakes decision situation as…**

| | | **strongly disagree** | | | | | | **strongly agree** |
|---|---|---|---|---|---|---|---|---|
| 1. | A situation that provides the opportunity to build relationships with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | A situation that helps define my individual self-concept. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | A loosely defined problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | A situation that gets increasingly more complicated as time passes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | A learning experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | A structured problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | A situation in which I apply what I already know to the current problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | A situation that is relatively unpredictable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | A situation that is relatively controllable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | A situation having relatively clear-cut outcomes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | A situation in which I feel connected to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | A situation that becomes simpler as time passes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | A situation having relatively unknowable outcomes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | An individual decision making experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | A group decision making experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. | An engaging experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | A situation in which possibilities are continuously emerging. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | A situation in which I feel relatively independent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | A situation in which I feel isolated from others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. | A situation in which I can apply what I have learned from the past because nothing much changes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. | An experience that connects me to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**I negotiate the decision making process to arrive at a preferred choice by…**

| | **strongly disagree** | | | | | | **strongly agree** |
|---|---|---|---|---|---|---|---|
| 22. Taking charge of the decision making process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. Trying to control the decision making process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Predicting cause-and-effect scenarios. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Trying to forecast the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. Developing an overall understanding of the problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. Focusing on the problem as a whole. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. Employing routine decision making behaviors. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. Carefully examining the characteristics of each choice option. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. Behaving in a machine-like manner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. Being open to all possible choice options. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. Examining each part of the problem separately. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. Being open to all possible sources of information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. Being responsive to others' concerns. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. Behaving in a flexible manner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. Adapting to changes in the situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37. Collaborating with others to arrive at a preferred choice. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 38. Arriving at a consensus with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 39. Listening to the opinions of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40. Listening to my own 'gut' feeling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 41. Focusing on agreement among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 42. Focusing on differences among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 43. Focusing on the variation in others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 44. Keeping a clear objective in mind throughout the decision process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 45. Co-participating with others in the decision making process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 46. Focusing on consistencies among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 47. | Trying to make the best possible decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 48. | Constantly revising my objectives as the decision process unfolds. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 49. | Focusing on internal motivations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 50. | Focusing on objective information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 51. | Focusing on personal values. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 52. | Relying on expert knowledge and opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 53. | Relying on internal wants and needs. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 54. | Seeking feedback on my opinions from others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 55. | Using a rational decision-making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 56. | Using a creative decision-making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 57. | Using an impromptu decision-making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 58. | Using an innovative decision-making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 59. | Trying to stay ‘level-headed’ throughout the decision process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 60. | Using a formal decision-making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 61. | Behaving in a spontaneous manner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 62. | Trying to stay flexible throughout the decision process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 63. | Adapting to new information that becomes available. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 64. | Staying consistent with previous decisions I have made. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 65. | Trying to ‘make sense’ out of the overall situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 66. | Taking one step at a time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 67. | Exploring multiple viewpoints. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 68. | Behaving in a rigid manner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 69. | Taking the shortest path towards finding a solution. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 70. | Trying to predict the consequences of my future actions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 71. | Focusing on variation in my behavior in past similar situations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 72. | Focusing on how I normally behave in past similar situations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 73. | Looking for contradictions in available information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 74. | Carefully considering all variables that may affect the outcomes of the decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 75. | Individually determining the best course of action. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 76. | Keeping an overall objective in mind rather than focusing on specific details. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 77. | Relying on outside experts to provide factual information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 78. | Relying on outside experts to give guidance and direction. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 79. | Forming an overall understanding of the problem using diverse viewpoints. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 80. | Using a novel decision making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 81. | Communicating with others to facilitate the decision process. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 82. | Individually collecting information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 83. | Focusing on my personal values. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 84. | Focusing on objective information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 85. | Relying on my intuition. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 86. | Knowing that I have come up with the best possible solution. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 87. | Using a ‘tried and true’ decision making approach. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 88. | Making a ‘good enough’ decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 89. | Encouraging the expression of others’ opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 90. | Focusing on factual information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 91. | Trying to make sense of the information that is available. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 92. | Trying to find specific solutions from the information that is available. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 93. | Focusing on discrepancies among available information sources. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 94. | Focusing on consensus recommendations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 95. | Seeking out unconventional sources of information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Part II.**

This section of the questionnaire asks you to respond to statements that relate to your personality, behaviors, and consumer styles. Please use the scales provided to respond to the statements.

| | **strongly disagree** | | | | **strongly agree** |
|---|---|---|---|---|---|
| 1. Getting very good quality is very important to me. | 1 | 2 | 3 | 4 | 5 |
| 2. Nice department and specialty stores offer me the best products. | 1 | 2 | 3 | 4 | 5 |
| 3. To get variety, I shop at different stores and choose different brands. | 1 | 2 | 3 | 4 | 5 |
| 4. Going shopping is one of the enjoyable activities in my life. | 1 | 2 | 3 | 4 | 5 |
| 5. The lower price products are usually my choice. | 1 | 2 | 3 | 4 | 5 |
| 6. I take the time to shop carefully for best buys. | 1 | 2 | 3 | 4 | 5 |
| 7. I prefer buying the best-selling brands. | 1 | 2 | 3 | 4 | 5 |
| 8. I really don't give my purchases much thought or care. | 1 | 2 | 3 | 4 | 5 |
| 9. The more I learn about products, the harder it seems to choose the best. | 1 | 2 | 3 | 4 | 5 |
| 10. I have favorite brands I buy over and over. | 1 | 2 | 3 | 4 | 5 |
| 11. Sometimes it's hard to choose which stores to shop. | 1 | 2 | 3 | 4 | 5 |
| 12. I make shopping trips fast. | 1 | 2 | 3 | 4 | 5 |
| 13. I usually have one or more outfits of the very newest style. | 1 | 2 | 3 | 4 | 5 |
| 14. I am impulsive when purchasing. | 1 | 2 | 3 | 4 | 5 |
| 15. I change brands I buy regularly. | 1 | 2 | 3 | 4 | 5 |
| 16. I look carefully to find the best value for the money. | 1 | 2 | 3 | 4 | 5 |
| 17. A product doesn't have to be perfect, or the best, to satisfy me. | 1 | 2 | 3 | 4 | 5 |
| 18. It's fun to buy something new and exciting. | 1 | 2 | 3 | 4 | 5 |
| 19. I go to the same stores each time I shop. | 1 | 2 | 3 | 4 | 5 |
| 20. The well-known national brands are best for me. | 1 | 2 | 3 | 4 | 5 |
| 21. In general, I usually try to buy the best overall quality. | 1 | 2 | 3 | 4 | 5 |
| 22. I enjoy shopping just for the fun of it. | 1 | 2 | 3 | 4 | 5 |
| 23. I carefully watch how much I spend. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 24. | A product doesn't have to be perfect, or the best, to satisfy me. | 1 | 2 | 3 | 4 | 5 |
| 25. | When it comes to purchasing products, I try to get the very best or perfect choice. | 1 | 2 | 3 | 4 | 5 |
| 26. | Shopping at stores wastes my time. | 1 | 2 | 3 | 4 | 5 |
| 27. | Once I find a product or brand I like, I stick with it. | 1 | 2 | 3 | 4 | 5 |
| 28. | I make special effort to choose the very best quality. | 1 | 2 | 3 | 4 | 5 |
| 29. | I shop quickly, buying the first product or brand I find that seems good enough. | 1 | 2 | 3 | 4 | 5 |
| 30. | The most advertised brands are usually very good choices. | 1 | 2 | 3 | 4 | 5 |
| 31. | Shopping is not a pleasant activity for me. | 1 | 2 | 3 | 4 | 5 |
| 32. | Often I make careless purchases I later wish I had not. | 1 | 2 | 3 | 4 | 5 |
| 33. | There are so many brands to choose from that often I feel confused. | 1 | 2 | 3 | 4 | 5 |
| 34. | My standards and expectations for products I buy are very high. | 1 | 2 | 3 | 4 | 5 |
| 35. | All the information I get on different products confuses me. | 1 | 2 | 3 | 4 | 5 |
| 36. | The more expensive brands are usually my choices. | 1 | 2 | 3 | 4 | 5 |
| 37. | I keep my wardrobe up-to-date with the changing fashions. | 1 | 2 | 3 | 4 | 5 |
| 38. | I buy as much as possible at sale prices. | 1 | 2 | 3 | 4 | 5 |
| 39. | I should plan my shopping more carefully than I do. | 1 | 2 | 3 | 4 | 5 |
| 40. | Fashionable, attractive styling is very important to me. | 1 | 2 | 3 | 4 | 5 |
| 41. | The higher the price of a product, the better its quality. | 1 | 2 | 3 | 4 | 5 |

| | | **definitely not true of myself** | | | | **definitely true of myself** |
|---|---|---|---|---|---|---|
| 1. | I try to avoid situations that require thinking in depth about something. | 1 | 2 | 3 | 4 | 5 |
| 2. | I'm not that good at figuring out complicated problems. | 1 | 2 | 3 | 4 | 5 |
| 3. | I enjoy intellectual challenges. | 1 | 2 | 3 | 4 | 5 |
| 4. | I am not very good at solving problems that require careful logical analysis. | 1 | 2 | 3 | 4 | 5 |
| 5. | I don't like to have to do a lot of thinking. | 1 | 2 | 3 | 4 | 5 |
| 6. | I enjoy solving problems that require hard thinking. | 1 | 2 | 3 | 4 | 5 |
| 7. | Thinking is not my idea of an enjoyable activity. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8. | I am not a very analytical thinker. | 1 | 2 | 3 | 4 | 5 |
| 9. | Reasoning things out carefully is not one of my strong points. | 1 | 2 | 3 | 4 | 5 |
| 10. | I prefer complex problems to simple problems. | 1 | 2 | 3 | 4 | 5 |
| 11. | Thinking hard and for a long time about something gives me little satisfaction. | 1 | 2 | 3 | 4 | 5 |
| 12. | I don't reason well under pressure. | 1 | 2 | 3 | 4 | 5 |
| 13. | I am much better at figuring things out logically than most people. | 1 | 2 | 3 | 4 | 5 |
| 14. | I have a logical mind. | 1 | 2 | 3 | 4 | 5 |
| 15. | I enjoy thinking in abstract terms. | 1 | 2 | 3 | 4 | 5 |
| 16. | I have no problem thinking things through carefully. | 1 | 2 | 3 | 4 | 5 |
| 17. | Using logic usually works well for me in figuring out problems in my life. | 1 | 2 | 3 | 4 | 5 |
| 18. | Knowing the answer without having to understand the reasoning behind it is good enough for me. | 1 | 2 | 3 | 4 | 5 |
| 19. | I usually have clear, explainable reasons for my decisions. | 1 | 2 | 3 | 4 | 5 |
| 20. | Learning new ways to think would be very appealing to me. | 1 | 2 | 3 | 4 | 5 |
| 21. | I like to rely on my intuitive impressions. | 1 | 2 | 3 | 4 | 5 |
| 22. | I don't have a very good sense of intuition. | 1 | 2 | 3 | 4 | 5 |
| 23. | Using my gut feelings usually works well for me in figuring out problems in my life. | 1 | 2 | 3 | 4 | 5 |
| 24. | I believe in trusting my hunches. | 1 | 2 | 3 | 4 | 5 |
| 25. | Intuition can be a very useful way to solve problems. | 1 | 2 | 3 | 4 | 5 |
| 26. | I often go by my instincts when deciding on a course of action. | 1 | 2 | 3 | 4 | 5 |
| 27. | I trust my initial feelings of people. | 1 | 2 | 3 | 4 | 5 |
| 28. | When it comes to trusting people, I can usually rely on my gut feelings. | 1 | 2 | 3 | 4 | 5 |
| 29. | If I were to rely on my gut feelings, I would often make mistakes. | 1 | 2 | 3 | 4 | 5 |
| 30. | I don't like situations in which I have to rely on intuition. | 1 | 2 | 3 | 4 | 5 |
| 31. | I think there are times when one should rely on one's intuition. | 1 | 2 | 3 | 4 | 5 |
| 32. | I think it is foolish to make important decisions based on feelings. | 1 | 2 | 3 | 4 | 5 |
| 33. | I don't think it is a good idea to rely on one's intuition for important decisions. | 1 | 2 | 3 | 4 | 5 |
| 34. | I generally don't depend on my feelings to help me make decisions. | 1 | 2 | 3 | 4 | 5 |
| 35. | I hardly ever go wrong when I listen to my deepest gut feelings to find an answer. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 36. | I would not want to depend on anyone who described himself or herself as intuitive. | 1 | 2 | 3 | 4 | 5 |
| 37. | My snap judgments are probably not as good as most people's. | 1 | 2 | 3 | 4 | 5 |
| 38. | I tend to use my heart as a guide for my actions. | 1 | 2 | 3 | 4 | 5 |
| 39. | I can usually feel when a person is right or wrong, even if I can't explain how I know. | 1 | 2 | 3 | 4 | 5 |
| 40. | I suspect my hunches are inaccurate as often as they are accurate. | 1 | 2 | 3 | 4 | 5 |

## Part III.

Indicate how easy or hard it would be for you to present yourself to others consistently and for a long time in the ways described by the statements.

| **A person who…** | **very easy** | | | | **very hard** |
|---|---|---|---|---|---|
| 1. Conforms. | 1 | 2 | 3 | 4 | 5 |
| 2. Will always think of something. | 1 | 2 | 3 | 4 | 5 |
| 3. Enjoys detailed work. | 1 | 2 | 3 | 4 | 5 |
| 4. Would sooner create something than improve it. | 1 | 2 | 3 | 4 | 5 |
| 5. Is prudent when dealing with authority or general opinion. | 1 | 2 | 3 | 4 | 5 |
| 6. Never acts without proper authority. | 1 | 2 | 3 | 4 | 5 |
| 7. Never seeks to bend (much less break) the rules. | 1 | 2 | 3 | 4 | 5 |
| 8. Likes bosses and work patterns which are consistent. | 1 | 2 | 3 | 4 | 5 |
| 9. Holds back ideas until they are obviously needed. | 1 | 2 | 3 | 4 | 5 |
| 10. Has fresh perspectives on old problems. | 1 | 2 | 3 | 4 | 5 |
| 11. Likes to vary set routines at a moment's notice. | 1 | 2 | 3 | 4 | 5 |
| 12. Prefers change to occur gradually. | 1 | 2 | 3 | 4 | 5 |
| 13. Is thorough. | 1 | 2 | 3 | 4 | 5 |
| 14. Is a steady plodder. | 1 | 2 | 3 | 4 | 5 |
| 15. Copes with several new ideas and problems at the same time. | 1 | 2 | 3 | 4 | 5 |
| 16. Is consistent. | 1 | 2 | 3 | 4 | 5 |
| 17. Is able to stand out in disagreement alone against a group of equals and seniors. | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| 18. Is stimulating. | 1 | 2 | 3 | 4 | 5 |
| 19. Readily agrees with the team at work. | 1 | 2 | 3 | 4 | 5 |
| 20. Has original ideas. | 1 | 2 | 3 | 4 | 5 |
| 21. Masters all details thoroughly. | 1 | 2 | 3 | 4 | 5 |
| 22. Proliferates ideas. | 1 | 2 | 3 | 4 | 5 |
| 23. Prefers to work on one problem at a time. | 1 | 2 | 3 | 4 | 5 |
| 24. Is methodical and systematic. | 1 | 2 | 3 | 4 | 5 |
| 25. Often risks doing things differently. | 1 | 2 | 3 | 4 | 5 |
| 26. Works without deviation in a prescribed way. | 1 | 2 | 3 | 4 | 5 |
| 27. Likes to impose strict order on matters within own control. | 1 | 2 | 3 | 4 | 5 |
| 28. Likes the protection of precise instructions. | 1 | 2 | 3 | 4 | 5 |
| 29. Fits readily into 'the system'. | 1 | 2 | 3 | 4 | 5 |
| 30. Needs the stimulation of frequent change. | 1 | 2 | 3 | 4 | 5 |
| 31. Prefers colleagues who never 'rock the boat'. | 1 | 2 | 3 | 4 | 5 |
| 32. Is predictable. | 1 | 2 | 3 | 4 | 5 |

**Part IV.**

In order to help us better interpret your responses to the questionnaire, please answer the following questions about yourself.

1. Sex:

Male _____ Female _____

2. Age:

_____

3. Race:

Black_____ White_____ American Indian_____ Hispanic_____ Asian_____ Other_____

4. Were you raised in the United States?

Yes_____ No_____

5. Marital status:

Single_____ Married_____ Divorced_____ Widowed_____

6. Are you currently employed?

Yes_____ No_____

7. Household size:

_____

**Thank you very much for your participation!!!**

# APPENDIX C

Questionnaire for Study Three

# Consumer Decision Making Survey III A


Tracey M. King
&
Naresh K. Malhotra

Your answers will not be tied to your identity so please be candid in your responses to the questions. The information collected here is for research purposes only; it is not intended for commercial or any other use and will not be shared or sold.

**GENERAL INSTRUCTIONS:**

In each section, please read each item carefully and answer by circling the appropriate number or filling in the blank. There are no right or wrong answers; please just answer with a meaningful and honest response. Some of the questions may sound repetitive or even the same; please answer all of them. There is no time limit to the study, you are free to work at your own pace and continue until you have completed all sections. Please turn the pages of the questionnaire only one at a time. If you have any questions raise your hand and the moderator will come to your seat. When you are finished, please bring the survey to the front of the room.

**PART I:**

Consumers are sometimes faced with making important, life-altering decisions. These types of decisions are called ***high-stakes consumer decisions*** and have important and risky outcomes for the consumer. In these decision situations, consumers may feel that an important goal, for example, one's health, safety or well-being, is being threatened. These decisions also tend to be emotional and generate stress. They typically involve making difficult tradeoffs in order to arrive at a choice. Examples of high-stakes consumer decisions include decisions regarding medical treatments, financial investments, careers or education, insurance, legal issues, housing and security, among others.

Take a minute to think about any high-stakes consumer decision situations you have experienced in the past. Try to recall (1) how you tend to think about or conceptualize these decision situations and (2) how you tend to negotiate the decision making process to arrive at a preferred choice. Keeping this in mind, please indicate the extent to which you agree or disagree with the following statements.

**I think about or conceptualize a high-stakes decision situation as…**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. An experience that unites me with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. A situation that is relatively unpredictable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. A situation in which I feel connected to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. A situation that gets increasingly more complicated as time passes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. A situation that is relatively stable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. An experience that connects me to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. A situation having relatively unknowable outcomes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. An opportunity to build relationships with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9. A constantly changing situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. A relatively autonomous experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. An opportunity to bond with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**I negotiate the decision making process to arrive at a preferred choice by…**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 12. Collaborating with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Focusing on differences among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. Carefully considering the opinions of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Focusing on the variation in others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Independently determining the best course of action. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. Co-participating with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Seeking out divergent viewpoints regarding the situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. Arriving at a consensus with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. Soliciting others' thoughts regarding the situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Exploring the diversity among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Avoiding contradictory information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART II:**

Below you will be provided with a specific example of a high-stakes consumer decision scenario. Please read the scenario and, as best as you can, place yourself into the role of the decision maker as described. You will then be asked to answer a series of questions related to your thoughts and anticipated actions.

> Suppose that you are a senior in college and have just inherited a lump sum of money from a grandparent. You have been thinking a lot about your future lately and have considered going back to graduate school. This is now an option for you given the money you received. However, you know that going back to school will take most all of this money and you will have to live modestly for the next two to three years. Going back to school will also not allow you to do other things such as buy a

new car, start a savings account, accumulate work experience, bring home a salary, and have your own apartment. But going back to school would be beneficial for you in other ways. You will receive a valuable degree, experience a new campus, avoid the stress of a new job, have more vacation time, and learn more about the subjects that interest you. Of course, there is absolutely no way of knowing if going back to school is more valuable than the work experience you would gain by taking a job or vice versa. To make this choice even more difficult, you have already received a good job offer from a company you like and have also already been accepted to school of your choice. To meet the mandatory deadlines, you will have to make your choice of whether or not to go back to school within the next two weeks.

Now put yourself in the role of this decision maker to answer the following questions.

**How would you rate the importance of this decision?**

| Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How would you rate the risk associated with the outcomes of this decision?**

| Not very risky | | | | | | Very risky |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How would you rate the emotionality of this decision?**

| Not very emotional | | | | | | Very emotional |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How would you rate the stressfulness of this decision?**

| Not very stressful | | | | | | Very stressful |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How likely is it that you would consult each of the following *personal sources* for information regarding this decision?**

| | | Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|---|---|
| 1. | Friend | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | School advisor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3. | Relative | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Classmate | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Financial advisor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Social or support group member | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How important to you is information from the following *personal sources*?**

| | | Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|---|---|
| 1. | Friend | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | School advisor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Relative | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Classmate | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Financial advisor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Social or support group member | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How likely is it that you would use each of the following *impersonal sources* to search for information regarding this decision?**

| | | Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|---|---|
| 1. | Newspapers | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Internet | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Books | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Television programming | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Statistical reports | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Brochures / Pamphlets | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | Seminars / Information sessions | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How important to you is information from the following *impersonal sources*?**

| | Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|---|
| 1. Newspapers | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Internet | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Books | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Television programming | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Statistical reports | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Brochures / Pamphlets | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Seminars / Information sessions | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART III:**

In high-stakes decision situations, such as the one described above, you can be presented with many different types of information, for example:

- Information about the drawbacks of choosing to engage in the behavior (going back to school)
- Information about the benefits of choosing to engage in the behavior (going back to school)
- An advisor or expert opinion on what choice you should make
- Information about the choices of others who were in a similar position

**How important to you are the following types of information?**

| | Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|---|
| 1. Information about the drawbacks | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Information about the benefits | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. An advisor or expert opinion | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Information about others' choices | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART IV:**

**Putting yourself back into the role of the decision maker as presented in the scenario, what is the choice that you would make?** (Place check mark in the appropriate blank)

Enroll in graduate school ____
Not enroll in graduate school ____

**Now indicate how well each adjective term below describes how you would feel if you actually had to make this decision.**

| | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|---|
| 1. Distressed | 1 | 2 | 3 | 4 | 5 |
| 2. Excited | 1 | 2 | 3 | 4 | 5 |
| 3. Upset | 1 | 2 | 3 | 4 | 5 |
| 4. Scared | 1 | 2 | 3 | 4 | 5 |
| 5. Enthusiastic | 1 | 2 | 3 | 4 | 5 |
| 6. Worried | 1 | 2 | 3 | 4 | 5 |
| 7. Alert | 1 | 2 | 3 | 4 | 5 |
| 8. Anxious | 1 | 2 | 3 | 4 | 5 |
| 9. Inspired | 1 | 2 | 3 | 4 | 5 |
| 10. Nervous | 1 | 2 | 3 | 4 | 5 |
| 11. Determined | 1 | 2 | 3 | 4 | 5 |
| 12. Afraid | 1 | 2 | 3 | 4 | 5 |
| 13. Uneasy | 1 | 2 | 3 | 4 | 5 |

**PART V:**

Recall that ***high-stakes consumer decisions*** are defined as those that have important and risky outcomes for a consumer. They are typically emotional, life-altering, and generate stress.

Again, try to recall (1) how you tend to think about or conceptualize these decision situations and (2) how you tend to negotiate the decision making process to arrive at a preferred choice. Keeping this in mind, please indicate the extent to which you agree or disagree with the following statements.

**I think about or conceptualize a high-stakes decision situation as…**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | An opportunity to bond with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | A situation having relatively unknowable outcomes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | A situation in which I feel connected to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | A constantly changing situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | A situation that is relatively stable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | An opportunity to build relationships with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | A situation that is relatively unpredictable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | An experience that connects me to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | A situation that gets increasingly more complicated as time passes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | A relatively autonomous experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | An experience that unites me with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**I negotiate the decision making process to arrive at a preferred choice by…**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 12. | Co-participating with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | Focusing on the variation in others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | Carefully considering the opinions of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | Avoiding contradictory information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. | Independently determining the best course of action. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | Collaborating with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | Exploring the diversity among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | Arriving at a consensus with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20. | Seeking out divergent viewpoints regarding the situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. | Soliciting others' thoughts regarding the situation | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. | Focusing on differences among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART VI:**

Below you will be provided with another specific example of a high-stakes consumer decision scenario. Please read the following scenario and, as best as you can, place yourself into the role described. Again, you will be asked to answer a series of questions related to your thoughts and anticipated actions.

> Imagine that you are faced with the stark news that you have been diagnosed with melanoma, which is a serious form of skin cancer. The first step in treatment is the surgical removal of the melanoma under or directly below the skin; however, following this procedure you are given the optional choice of chemotherapy treatment. Your chemotherapy would be offered as a preventative treatment – to try to stop your melanoma from coming back in the future if you had cancer cells in your lymph nodes that went undetected. Chemotherapy may prolong life by several months or even years if this was the case. However, treating melanoma with chemotherapy is still experimental; it is not proven that it helps prevent melanoma from coming back. Because chemotherapy can kill normal blood cells along with cancer cells, patients may have an increased chance of infection and abnormal bleeding after injuries, which can be very dangerous. Furthermore, the chemotherapy itself may be associated with adverse effects such as nausea, vomiting, hair loss, mouth sores, and fatigue, leading to a reduction in quality of life. A considerable proportion of patients experience side effects without gaining much benefit. Your surgery is scheduled for two weeks from today. Before then, you must make a decision whether or not you want to receive the chemotherapy treatment.

Now put yourself in the role of this decision maker to answer the following questions.

**How would you rate the importance of this decision?**

| Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How would you rate the risk associated with the outcomes of this decision?**

| Not very risky | | | | | | Very risky |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How would you rate the emotionality of this decision?**

| Not very emotional | | | | | | Very emotional |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How would you rate the stressfulness of this decision?**

| Not very stressful | | | | | | Very stressful |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How likely is it that you would consult each of the following *personal sources* for information regarding this decision?**

| | | Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|---|---|
| 1. | Friend | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Physician | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Relative | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Classmate | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Nurse | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Social or support group member | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How important to you is information from the following *personal sources*?**

| | | Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|---|---|
| 1. | Friend | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Physician | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Relative | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Classmate | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Nurse | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Social or support group member | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How likely is it that you would use each of the following *impersonal sources* to search for information regarding this decision?**

| | | Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|---|---|
| 1. | Newspapers | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Internet | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Books | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Television programming | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Statistical reports | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Brochures / Pamphlets | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | Seminars / Information sessions | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How important to you is information from the following *impersonal sources*?**

| | | Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|---|---|
| 1. | Newspapers | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Internet | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Books | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Television programming | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Statistical reports | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Brochures / Pamphlets | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | Seminars / Information sessions | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART VII:**

Again, putting yourself in the role of this decision maker, please answer the following questions.

**How likely is it that you would initiate a discussion with your physician regarding the risks associated with the choice options in this decision situation?**

| Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How likely is it that you would initiate a discussion with your physician regarding the benefits associated with the choice options in this decision situation?**

| Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**How likely is it that you would initiate a discussion with your physician regarding your choice preferences in this decision situation?**

| Not very likely | | | | | | Very likely |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Overall, throughout the decision making process, how much interaction with your physician would you initiate?**

| A limited amount of interaction | | | | | | A large amount of interaction |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Given the risks and benefits associated with your choice options, who should decide how acceptable those risks and benefits are for you?**

The doctor alone _____
Mostly the doctor _____
Both equally _____
Mostly me _____
Me alone _____

**Given the risks and benefits associated with your choice options, who should decide whether or not you should take the chemotherapy treatment?**

The doctor alone _____
Mostly the doctor _____
Both equally _____
Mostly me _____
Me alone _____

**PART VIII:**

In high-stakes decision situations, such as the one described above, you can be presented with many different types of information, for example:

- Information about the drawbacks of choosing to engage in the behavior (going back to school)
- Information about the benefits of choosing to engage in the behavior (going back to school)
- An advisor or expert opinion on what choice you should make
- Information about the choices of others who were in a similar position

**How important to you are the following types of information?**

| | Not very important | | | | | | Very important |
|---|---|---|---|---|---|---|---|
| 1. Information about the drawbacks | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. Information about the benefits | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. An advisor or expert opinion | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Information about others' choices | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART IX:**

**Putting yourself back into the role of the decision maker as presented in the scenario, what is the choice that you would make?** (Place check mark in the appropriate blank)

Choose the chemotherapy treatment ____
Not choose the chemotherapy treatment ____

**Indicate how well each adjective term below describes how you would feel if you actually had to make this decision.**

| | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|---|
| 1. Distressed | 1 | 2 | 3 | 4 | 5 |
| 2. Excited | 1 | 2 | 3 | 4 | 5 |
| 3. Upset | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4. | Scared | 1 | 2 | 3 | 4 | 5 |
| 5. | Enthusiastic | 1 | 2 | 3 | 4 | 5 |
| 6. | Worried | 1 | 2 | 3 | 4 | 5 |
| 7. | Alert | 1 | 2 | 3 | 4 | 5 |
| 8. | Anxious | 1 | 2 | 3 | 4 | 5 |
| 9. | Inspired | 1 | 2 | 3 | 4 | 5 |
| 10. | Nervous | 1 | 2 | 3 | 4 | 5 |
| 11. | Determined | 1 | 2 | 3 | 4 | 5 |
| 12. | Afraid | 1 | 2 | 3 | 4 | 5 |
| 13. | Uneasy | 1 | 2 | 3 | 4 | 5 |

**PART X:**

**How much experience have you had making *high-stakes consumer decisions* in your own personal life?**

A very low amount of experience  A very high amount of experience

1  2  3  4  5  6  7

**How many of these types of decision situations have you been faced with in the past two years?**

_____

**Have you been diagnosed with a serious illness in the past two years?**

Yes _____
No _____

**Have you had to undergo surgery in the past two years?**

Yes _____
No _____

**Have you been hospitalized in the past two years?**

Yes _____
No _____

**PART XI:**

**Please indicate the extent to which you agree or disagree with the following statements.**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | I find that establishing a consistent routine enables me to enjoy life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | I dislike unpredictable situations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | I tend to put off important decisions until the last moment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | I dislike it when a person's statement could mean many different things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Even after I have made up my mind about something, I am always eager to consider a different opinion. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | I usually make important decisions quickly and confidently. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | I enjoy having a clear structured mode of life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | When considering most conflict situations, I usually see how much both sides could be right. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | I feel uncomfortable when someone's meaning or intentions are unclear to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | I don't like to be with people who are capable of unexpected actions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | I like to have a place for everything and everything in its place. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | When thinking about a problem, I consider as many different opinions on the issue as possible. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | I feel uncomfortable when I don't understand the reason why an event occurred in my life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | I prefer to socialize with familiar friends because I know what to expect of them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | I would describe myself as indecisive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. | I find that a well-ordered life with regular hours suits my temperament. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | When I am confused about an important issue, I feel very upset. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | I enjoy the uncertainty of going into a situation without knowing what might happen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | I always see many possible solutions to problems I face. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. | I tend to struggle with most decisions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**PART XII.**

In order to help us better interpret your responses to the questionnaire, please answer the following questions about yourself.

**Sex:**

Male _____
Female _____

**Age (in years):**

_____

**Race:**

Black _____
White _____
American Indian _____
Hispanic _____
Asian _____
Other _____

**Were you raised in the United States?**

Yes _____
No _____

**Are you currently employed full-time or part-time?**

Employed full-time _____
Employed part-time _____
Not employed _____

## Thank you very much for your participation!!!

## APPENDIX D

Questionnaire for Study Four

# Consumer Healthcare Decisions Survey


Ms. Tracey King, Ph.D. Candidate & Instructor in Marketing
Georgia Institute of Technology

Dr. Naresh Malhotra, Regents Professor of Marketing
Georgia Institute of Technology

*You are being asked to participate in an academic research project that investigates consumer decisions regarding healthcare. Some of the questions will refer to various healthcare and medical experiences. The researchers listed above will be the only people who have access to your responses. Your answers will not be tied to your identity in any way so please be candid in your responses to the questions. The information collected here is for research purposes only; it is not intended for commercial or any other use and will not be shared or sold. The results of the project will only be reported in summary form; no individual responses will be reported. By filling out the survey you are offering your research consent. If you have any questions please contact Ms. Tracey King (770-366-1829) or Dr. Naresh Malhotra (404-894-4358). Thank you in advance for your participation.*

**GENERAL INSTRUCTIONS:**

*In each section, please read all of the instructions and each of the items carefully and answer by circling the appropriate number, filling in the blank, or placing a check-mark on the appropriate line. There are no right or wrong answers; simply answer with a meaningful and honest response. Some of the questions may sound repetitive or even the same; please answer all of them.*

**SECTION I:**

*In this section you will be asked a series of questions related to how you think about and make high-stakes consumer decisions. A definition of high-stakes consumer decisions is given in the box below. One example of a high-stakes consumer decision is your decision of whether or not to use hormone therapy, commonly referred to as HRT. Here, HRT refers to estrogen treatment or estrogen treatment combined with other hormones such as progestogen, progestin or progesterone. The expectation is that this is a decision that you are currently facing, have recently faced, or will face in the near future.*

Consumers are sometimes faced with making important and life-altering consumption decisions. These types of decisions are called **high-stakes consumer decisions** and have important and risky outcomes for the consumer. In these decision situations, consumers may feel that an important goal, for example, one's health, safety or well-being is being threatened. These decisions also tend to be emotional and generate stress. They often involve making difficult tradeoffs in order to arrive at a choice. Examples of high-stakes consumer decisions include decisions regarding medical treatments, financial investments, careers or education, insurance, legal issues, housing and security, among others.

**How much experience have you had making these types of high-stakes consumer decisions in your own personal life?**

| A limited amount of experience | | | | | | A large amount of experience |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

The decision of whether or not to use hormone therapy (HRT) possesses the characteristics of a **high-stakes consumer decision**. HRT use has both harmful and beneficial effects and remains controversial. Because of the difficulty in being able to predict how HRT will impact each woman individually, outcome uncertainty is also involved. In addition, the decision process may be emotional and generate stress for some women.

*Now try to recall how you tend to think about or conceptualize high-stakes consumer decisions such as the decision of whether or not to use HRT. Also recall how you tend to negotiate the decision making process to arrive at a preferred choice. Keeping this in mind, please indicate the extent to which you agree or disagree with the following statements.*

**I think about or conceptualize a high-stakes consumer decision situation as…**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. An experience that unites me with others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. A situation that is relatively unpredictable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. A situation in which I feel connected to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. A situation that gets increasingly more complicated as time passes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. An experience that connects me to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. A constantly changing situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**I negotiate the decision making process to arrive at a preferred choice by…**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 7. Carefully considering the opinions of others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Focusing on the variation in others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. Seeking out divergent viewpoints regarding the situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Soliciting others' thoughts regarding the situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. Exploring the diversity among others' opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION II:**

*In this section you will be asked a series of questions regarding your perceptions of medicine and health-related issues.*

**Please indicate the extent to which you agree or disagree with the following statements regarding menopause in general:**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. I associate the arrival of menopause with a sense of relief. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I associate the arrival of menopause with a sense of regret. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I have positive feelings toward menopause. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4. | Menopause is a natural life event. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Menopause is a dreaded life event. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Menopause is something to look forward to. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate the extent to which you agree or disagree with the following statements regarding medicine in general:**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | In general, my first response is to take medication for the treatment of my illnesses. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | If I am not feeling well, I will typically take medicine to feel better. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | In general, I view medical treatment as positive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | The treatment of medical conditions using medication is overall acceptable to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## SECTION III:

*In this section you will be asked a series of questions related to your perceptions of hormone therapy (HRT) use. Recall that HRT use refers to estrogen treatment or estrogen treatment combined with other hormones such as progestogen, progestin or progesterone.*

**Please indicate the extent to which you agree or disagree with the following statements regarding HRT use:**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | I believe that using HRT helps reduce menopausal symptoms such as hot flashes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | I am concerned that using HRT results in an increased risk of uterine cancer in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | I believe that using HRT helps reduce the risk of heart disease in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | I believe that using HRT helps reduce the risk of osteoporosis in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | I am concerned that using HRT results in an increased risk of breast cancer in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate your likelihood of using or continuing to use HRT based on the following outcomes associated with HRT use:**

| | ***How likely are you to use or continue to use HRT to the extent that it…*** | Extremely unlikely | | | | | | Extremely likely |
|---|---|---|---|---|---|---|---|---|
| 1. | Reduces menopausal symptoms such as hot flashes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Increases the risk of uterine cancer in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3. | Reduces the risk of heart disease in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Reduces the risk of osteoporosis in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Increases the risk of breast cancer in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## Please indicate your beliefs, feelings, and overall attitude regarding HRT use:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. | ***I think that using HRT is…*** | Harmful | | | | | | Beneficial |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Safe | | | | | | Unsafe |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Valuable | | | | | | Worthless |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Healthy | | | | | | Unhealthy |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Dangerous | | | | | | Safe |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | ***Overall, my cognitive beliefs regarding HRT use are…*** | Negative | | | | | | Positive |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | ***Using HRT makes or would make me feel…*** | Not worried | | | | | | Anxious |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Pleasant | | | | | | Unpleasant |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Uneasy | | | | | | Comfortable |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Relaxed | | | | | | Nervous |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Unrewarded | | | | | | Rewarded |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | ***Overall, my feelings towards HRT use are…*** | Negative | | | | | | Positive |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5. | ***My overall attitude towards HRT use is…*** | Good | | | | | Bad |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Negative | | | | | Positive |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | Unfavorable | | | | | Favorable |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate the extent to which you agree or disagree with the following statements regarding HRT use:**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | I have strong mixed reactions both for and against HRT use, all at the same time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | I do not find myself feeling torn between the trade-offs associated with HRT use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | I feel a strong amount of conflict regarding my reactions to HRT use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | I am very much undecided in my reactions to HRT use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | I have a completely one-sided reaction towards HRT use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | I would describe my thoughts and feelings towards HRT use as ambivalent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate the extent to which you agree or disagree with the following statements regarding the use or continued use of HRT:**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | People who are important to me would recommend that I use HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | I feel under some social pressure to use HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | People who are important to me would encourage me to use HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | People who are important to me would think it is appropriate for me to use HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | The people in my life who opinions I value would approve of my use of HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | I think that many people like me use HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate the extent to which you agree or disagree with the following statements regarding the use or continued use of HRT:**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. If I wanted to, using HRT would be very easy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I am confident that I could use HRT if I wanted to. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. For me, using HRT would be difficult even if I wanted to. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The decision to use HRT is beyond my control. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I feel that the decision of whether or not I use HRT is mostly up to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. There are a lot of factors not under my control that would restrain me from using HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate the extent to which you agree or disagree with the following statements regarding the use or continued use of HRT in the future:**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. I expect to use or continue to use HRT in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I intend to use or continue to use HRT in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. It is likely that I will use or continue to use HRT in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I plan to use or continue to use HRT in the future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION IV:**

*In this section you will be asked a series of questions regarding your anticipated, current, or past use of HRT. As mentioned before, HRT refers to estrogen treatment or estrogen treatment combined with other hormones such as progestogen, progestin or progesterone.*

**Please indicate your current status regarding HRT use (choose only one option):**

| | |
|---|---|
| I have never used HRT in the past and I <u>do not</u> intend to use HRT in the future. | _____ |
| I have never used HRT in the past but I <u>do</u> intend to use HRT in the future. | _____ |
| I am currently using HRT. | _____ |
| I have used HRT in the past and I <u>do not</u> intend to use HRT again in the future. | _____ |
| I have used HRT in the past and I <u>do</u> intend to use it again in the future. | _____ |

**If you are currently using HRT or have used HRT in the past, please indicate the extent to which you agree or disagree with the following statements regarding your satisfaction with HRT. If you have never used HRT, please move on to the next page.**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. Using HRT effectively relieved my menopausal symptoms. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I am satisfied with the side effects related to HRT use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am satisfied with the ease and convenience of using HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Using HRT has positively impacted my quality of life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Overall, I am satisfied with using HRT. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I am likely to recommend the use of HRT to a friend who is experiencing menopausal symptoms. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate your actual or anticipated feelings regarding the decision to use HRT. If you have never used HRT, try to predict how you would feel if/when you had to make this decision. If you are currently using HRT or have used HRT in the past, try to recall how you felt when you made your decision of whether or not to use HRT:**

| | Very slightly or not at all | A little | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|---|
| 14. Distressed | 1 | 2 | 3 | 4 | 5 |
| 15. Excited | 1 | 2 | 3 | 4 | 5 |
| 16. Upset | 1 | 2 | 3 | 4 | 5 |
| 17. Scared | 1 | 2 | 3 | 4 | 5 |
| 18. Enthusiastic | 1 | 2 | 3 | 4 | 5 |
| 19. Worried | 1 | 2 | 3 | 4 | 5 |
| 20. Alert | 1 | 2 | 3 | 4 | 5 |
| 21. Anxious | 1 | 2 | 3 | 4 | 5 |
| 22. Inspired | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 23. | Nervous | 1 | 2 | 3 | 4 | 5 |
| 24. | Determined | 1 | 2 | 3 | 4 | 5 |
| 25. | Afraid | 1 | 2 | 3 | 4 | 5 |
| 26. | Uneasy | 1 | 2 | 3 | 4 | 5 |

**Please indicate the extent to which you agree or disagree with the following statements regarding your actual or anticipated decision regarding HRT use:**

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1. | I experienced or would experience a large amount of negative emotion from making this decision. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Making this decision did not or would not generate much negative emotion for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | This decision making process generated or would generate a high level of negative emotion for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION V:**

*In this next section you will be asked a series of questions related to your information search and knowledge level regarding the decision of whether or not to use HRT. If you have already made this decision, please refer to your own experiences. If you expect to make this decision in the future, please refer to your anticipated actions.*

**To what extent did you consult or would you consult the following *personal sources* for information regarding this decision?**

| | | A limited extent | | | | | | A great extent |
|---|---|---|---|---|---|---|---|---|
| 7. | Friend | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | Doctor | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | Relative | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | Classmate | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | Nurse | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | Social or support group member | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Overall, how important to you is information from *personal sources*?**

| Not very important | | | | | Very important | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**To what extent did you use or would you use the following *impersonal sources* to search for information regarding this decision?**

| | | A limited extent | | | | | | A great extent |
|---|---|---|---|---|---|---|---|---|
| 1. | Newspapers | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Magazines | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Internet | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Books | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Television programming | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Statistical reports | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Brochures / Pamphlets | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | Seminars / Information sessions | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | Radio programming | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Overall, how important to you is information from *impersonal sources*?**

Not very important Very important

1 2 3 4 5 6 7

**Overall, how knowledgeable do you feel about the decision of whether or not to use HRT?**

Not very knowledgeable Very knowledgeable

1 2 3 4 5 6 7

**Please read the following statements about HRT use and answer to the best of your ability: (*Answer 'true' if you believe the statement is correct; answer 'false' if you believe it is incorrect*)**

| | | True | False | I don't know |
|---|---|---|---|---|
| 1. | The use of estrogen alone may decrease chances of a heart attack. | _____ | _____ | _____ |
| 2. | The use of estrogen alone may increase risk of breast cancer. | _____ | _____ | _____ |
| 3. | The use of estrogen reduces the risk of postmenopausal osteoporosis. | _____ | _____ | _____ |

| | | | | |
|---|---|---|---|---|
| 4. | The use of estrogen combined with progestogen may increase chances of a heart attack. | _____ | _____ | _____ |
| 5. | The use of estrogen is safer if progestogen is taken with it. | _____ | _____ | _____ |
| 6. | The use of estrogen combined with progestogen may increase risk of a stroke. | _____ | _____ | _____ |
| 7. | The use of estrogen combined with progestogen may increase risk of a blood clot. | _____ | _____ | _____ |
| 8. | The use of estrogen combined with progestogen may decrease chances of a hip fracture. | _____ | _____ | _____ |
| 9. | The use of estrogen combined with progestogen may decrease chances of colon cancer. | _____ | _____ | _____ |
| 10. | The use of estrogen alone is associated with a higher risk of endometrial (uterine) cancer. | _____ | _____ | _____ |

**SECTION VI:**

*This section includes a series of questions regarding your interactions with health care providers.*

**Have you had a discussion about HRT use with your primary gynecological health care provider?**

Yes _____
No _____

**If you answered 'yes' to the above question, then who *initiated* the discussion about HRT use? If you answered 'no' to the above question, please move on to the next question.**

Myself _____
Health care provider _____

**I believe that my primary gynecological health care provider's recommendation is for me to…**

Use HRT _____
Not use HRT _____
I'm not sure _____

**How likely is it that you initiated or would initiate a discussion with a health care provider regarding the following factors related to HRT use?**

| | Very unlikely | | | | | | Very likely |
|---|---|---|---|---|---|---|---|
| 1. The risks associated with the choice options. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2. The benefits associated with the choice options. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Your choice preferences. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The costs associated with the choice options. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Please indicate the extent to which you agree or disagree with the following statements:**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. I would prefer to make the decision regarding HRT use all by myself. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I would prefer to have a doctor make the decision regarding HRT use for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I would prefer to share the decision making regarding HRT use with my doctor. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I would prefer to actively participate with my doctor in the decision making process regarding HRT use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I would prefer leaving the decision regarding HRT use up to my doctor. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I would prefer to make the decision regarding HRT use with limited input from my doctor. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION VII:**

*In this section you will be asked questions regarding your health, medical history and personality.*

**Are you experiencing what you perceive as symptoms of menopause or perimenopause?**

Yes _____
No _____

**Overall, how would you rate the severity of your menopausal symptoms?**

| None | Mild | Moderate | Severe | Very severe |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

**How often are you experiencing a menstrual period?**

Regularly (occurring 1-3 months apart) _____
Irregularly (occurring 3-12 months apart) _____
I have not had a period for more than 12 months _____

**Have you been diagnosed with a serious disease or illness? If yes, please list.**
*(Feel free to list more than one if applicable)*

Yes _____ _____
No _____

**Have you had a hysterectomy?**

Yes _____
No _____

**How often do you conduct a breast self-exam?**

Never _____
Rarely (1-3 times per year) _____
Occasionally (once every 2-3 months) _____
Regularly (at least once per month) _____

**How often do you have a breast cancer screening (e.g., mammogram)?**

Never _____
Rarely (once every 5 years or more) _____
Occasionally (once every 2-4 years) _____
Regularly (at least once per year) _____

**How often do you have a cervical cancer screening (e.g., pap smear)?**

Never _____
Rarely (once every 5 years or more) _____
Occasionally (once every 2-4 years) _____
Regularly (at least once per year) _____

**Please indicate the extent to which you agree or disagree with the following statements:**

| | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|
| 1. It is important to me to have really nice things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I would like to be rich enough to buy anything I want. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I'd be happier if I could afford to buy more things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. It sometimes bothers me quite a bit that I can't afford to buy all the things I want. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. People place too much emphasis on material things. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6. It's really true that money can buy happiness. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION IX.**

*In order to help us better interpret your responses to the questionnaire, please answer the following questions about yourself.*

**Age (in years):**

_____

**Race / Ethnicity:**

Black _____
White _____
American Indian _____
Hispanic _____
Asian _____
Other _____

**Marital status:**

Single and never married _____
Married _____
Separated or divorced _____
Widowed _____

**Highest education level completed:**

Grade school _____
Junior high _____
Some high school _____
High school degree _____
Trade school degree _____
Some college _____
College undergraduate degree _____
College graduate degree _____

**Are you currently employed full-time or part-time?**

Employed full-time _____
Employed part-time _____
Not in paid employment _____

**Annual income level:**

Less than $10,001 _____
$10,001 to $20,000 _____
$20,001 to $40,000 _____

$40,001 to $60,000 _____
$60,001 to $80,000 _____
More than $80,000 _____

**Do you have health insurance coverage?**

Yes _____
No _____
I don't know _____

**Thank you very much for your participation!!!**

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